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IMPROVED

FOOD HANDLING FACILITIES FOR

SAN JUAN, PUERTO RICO

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Marketing Research Report No. 722

UNITED STATES DEPARTMENT OF AGRICULTURE

Agricultural Research Service

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SUMMARY

A new consolidated and efficient wholesale food distribution center at a convenient location in San Juan is recommended to replace the present facilities, which are scattered, inefficient, and outmoded. The central market would have facilities for handling all types of food.

The major part of the food imported into Puerto Rico must pass through the marketing facilities in San Juan, the island's largest metropolitan area. The 83 operators handled over 775,000 tons of food products in 1962, of which about 600,000 tons were imported, and about 175,000 tons were received from Puerto Rican operators and producers.

The facilities used in wholesaling food are scattered throughout the metropolitan area. The largest single concentration of operators is in the old San Juan area adjacent to the piers and contains about half of all the food wholesalers in the city. Much smaller groups are located in Rio Piedras, Santurce, and Bayamon. Others are scattered throughout the city.

The inefficiencies and other unsatisfactory conditions have been known for years. The major inadequacies are inefficient facilities, narrow and congested streets and service areas, poor parking areas and locations, poor working conditions, lack of proper wharf facilities, lack of a concentrated market, lack of market regulation and enforcement, poor facilities for truckers and farmers, poor handling methods, poor working conditions, unsanitary facilities, and fire hazards. All of these have contributed to high costs of operation and have made it difficult for many operators to remain in business under competitive conditions.

Improved facilities would be required for 61 operators. The facilities needed include 6 multiple-occupancy buildings with 76 standard units and 2 limited-occupancy buildings. These would provide 588,675 square feet of space and would replace 662,127 square feet of inefficient space now occupied by the 61 operators. This is 88.9 percent of the space now occupied by these operators. Adequate space is included for parking, as well as for expansion of facilities in the future. In addition, two units in the multiple-occupancy building are planned for a restaurant and bank. Streets at least 200 feet wide are provided where buildings face each other.

These facilities, with adequate space for expansion and space for a limited number of allied facilities, would require about 66 acres which can be obtained in the Puerto Nuevo section of San Juan. Other sites are available, but do not possess the many advantages of this site.

Annual costs could be reduced from \$4.7 million to \$4 million, a net saving of \$700,000. These costs include (1) moving products into, through, and out of the wholesale marketing facilities, (2) transferring products between operators, (3) spoilage, waste, deterioration, and theft, and (4) rentals. Benefits would accrue to producers, wholesalers, and consumers of products handled in the market.

To buy the land and construct the facilities required would cost \$11.9 million. The average annual rentals required to finance the project would be about \$1.60 per square foot of floor space if constructed by an authority of the Commonwealth government and \$2.60 per square foot if constructed by private financing.

Improved Food Handling Facilities For San Juan, Puerto Rico

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INTRODUCTION

Wholesale food marketing facilities that were designed for volumes and conditions of many years ago are definitely inadequate for today's needs. This is especially true in San Juan, P.R. Realizing this, the government of Puerto Rico, the city of San Juan, and various interested groups requested the U.S. Department of Agriculture to conduct research studies to improve the facilities being used.

In 1949 a study of wholesale food marketing facilities for San Juan was started by the U.S. Department of Agriculture in cooperation with the Puerto Rico Department of Agriculture. In 1951 the findings and results of this study were published.² Soon after this, steps were taken by various agencies of the Commonwealth to act upon the recommendations. Some construction has been completed, other is underway, and additional is planned in the area proposed in 1951.

In 1962 officials of the Commonwealth government felt that food wholesaling in the metropolitan area of San Juan had changed to such an extent that new studies should be made to determine the additional needs and types of changes that had occurred. The area which was recommended in the earlier report had been acquired and a large part of it was in condition to build. Construction for allied industries had progressed in the area and there was serious question as to whether the unobligated portions of the site were sufficient to construct the remainder of a modern food distribution center that would serve San Juan and, to a lesser extent, Puerto Rico. Because of this, and the sweeping changes in the methods of transportation, handling techniques, and types of products, the U.S. Department of

Agriculture, in cooperation with the U.S. Department of Commerce, the Puerto Rico Department of Agriculture, and the Puerto Rico Department of Commerce, undertook this study.

The U.S. Department of Commerce made available the funds for the study through the Area Redevelopment Administration, the U.S. Department of Agriculture supplied the technical personnel, and the Puerto Rico Departments of Agriculture and Commerce furnished field personnel, office space, and assistance in obtaining the necessary information.

The study, which was under the supervision of the Transportation and Facilities Research Division of the Agricultural Research Service, had the following objectives:

1. To analyze the existing food wholesaling facilities in San Juan to determine the adequacy for present and future needs.
2. To estimate the major costs of handling food products in the present wholesale markets and facilities.
3. To determine the kinds and amounts of facilities needed for efficient wholesale marketing of food in San Juan.
4. To estimate the costs of construction and income required for improved marketing facilities.
5. To outline the benefits that might be derived from improved and efficient handling facilities.

Data in this report are for the year 1962, unless otherwise noted. Data were obtained primarily by interviews with wholesalers handling the various food commodities, representatives of the government of Puerto Rico, personnel of the city of San Juan, and various civic and industry groups.

The study published in 1951 by the U.S. Department of Agriculture recommended the construction of several facilities that are closely related to food distribution. These recommendations included improved facilities for marketing and slaughtering livestock and for processing meats. In addition, facilities were also recom-

¹Mr. Long was on leave from the Virginia Polytechnic Institute, Blacksburg, Va., for 1 year during the course of this study.

²ORTEN, C. J., SERRA, G., and MORELL, B. M. MARKETING FACILITIES FOR FARM AND RELATED PRODUCTS AT SAN JUAN, PUERTO RICO. U.S. Dept. Agr. Inf. Bul. No. 60, 169 pp. 1951.

mended for grain storage, feed mixing, milling, vegetable-oil extracting, and others. Since these facilities have been constructed, they are not included in this study. Limited investigations were conducted on the operation of the livestock slaugh-

tering and meat processing facility, but primarily from the standpoint of information rather than analysis. This study is limited to the wholesale food distribution facilities in and around San Juan.

IMPORTANCE OF FOOD MARKETING IN PUERTO RICO

Because of its strategic location, density of population, and facilities, San Juan is the major food wholesaling center of Puerto Rico. In 1960 Puerto Rico had a population of 2,349,540. The standard metropolitan statistical area of San Juan had 588,800, or 25.1 percent of the total population of the island.³ There are two other standard metropolitan areas in Puerto Rico—Mayaguez with a total population of 83,852 and Ponce with a total population of 145,584. The three areas contain 818,263, or 34.8 percent of the total population of the Commonwealth. Between 1950 and 1960 the population of the island increased 6.3 percent. During this same period, the population of San Juan increased 26.4 percent, Ponce increased 14.8 percent, and Mayaguez decreased 4.0 percent.⁴

Location helps make San Juan the most important food wholesaling area in Puerto Rico. It is the hub of the highway system. Excellent highways radiate from the city to other points, especially the other major cities on the island. It is a seaport on the northern side of the island, which makes it convenient for shipping to and from the United States. Figure 1 shows the locations of the major cities in Puerto Rico and their relationship to each other, as well as the connecting highway systems.

In addition to the growing population, the island is rapidly becoming a mecca for the American tourist, especially since vacation areas in Cuba are no longer available for tourists from the

United States. If the tourist is to be attracted to Puerto Rico, a continuous supply of high quality foods must be available.

Incomes are increasing on the island and, as a result, the demand for higher quality food, along with a greater quantity, is evident. Per capita personal income climbed from \$589 in 1960 to \$718 in 1963.⁵ The rate of gain between 1960 and 1962 was exceeded only in Japan and Italy. As incomes continue to increase, the kinds and amounts of food consumed are almost sure to change. Until the food needs of the island are moderately satisfied, increasing amounts of personal income will be used to obtain food. San Juan is the most important market for food, both at retail and at wholesale, on the island.

San Juan has the most extensive seaport and airport facilities on the island. The airport is capable of handling any type of aircraft, and the seaport is well protected and capable of handling a large number and a wide range of sizes of ships. Over 60 percent of the food consumed in Puerto Rico must be imported by sea or air, and an extremely high percentage of this moves through facilities in San Juan. Figure 2 shows the distance from San Juan to major cities where products originate.

San Juan also serves as a major diverting or transshipping point for food and other products destined for other locations in the Caribbean area. Figure 3 shows the relationship of Puerto Rico to other areas in the Caribbean.

RECEIPTS OF FOOD PRODUCTS BY WHOLESALERS

The variety of food products available for distribution and consumption in Puerto Rico is quite similar to that which is available to the average housewife in the United States. The major difference is in the wide variety and high quality of tropical fruits and vegetables available for consumption in Puerto Rico. Many of these are not available in the United States because they cannot

be transported great distances and must be consumed fresh to be appreciated. A wide variety of meats and other foods are available to the Puerto Rican consumer.

Throughout this report the following classification of food products will be used: (1) Fruits and vegetables includes those fresh products commonly referred to and also tropical varieties produced in Puerto Rico. (2) Meat and meat products includes fresh and frozen meat and meat products. Canned meat products are excluded. (3) Groceries and other products includes a wide range of products such as flour, shortening, canned meats,

³ Further references to San Juan are to the standard metropolitan statistical area as defined by the Bureau of the Census, U.S. Dept. of Commerce, unless specifically noted otherwise.

⁴ U.S. BUREAU OF THE CENSUS. U.S. CENSUS OF POPULATION: 1960. GENERAL SOCIAL AND ECONOMIC CHARACTERISTICS, PUERTO RICO. Final Report PC(1)-S3C, 224 pp. Washington. 1962.

⁵ MOSKIN, ROBERT J. PUERTO RICO: ISLAND AT A CROSSROADS. Look, Mar. 24, 1964, pp. 26-42.

and other canned or boxed foods. The volume of products classified as groceries and other products reflects all operators wholesaling food that did not fall into the categories of fruits and vegetables or meat and meat products exclusive of fresh dairy products.

Volume of Products

The 83 food wholesalers in Metropolitan San Juan received a total of 775,426 tons of food in 1962.⁶ This volume, if consumed only in San Juan, would more than satisfy the food needs of the city. However, a large part of the island receives food through the facilities in San Juan. In addition to the food handled by wholesalers, large quantities of fresh products, including meat, are marketed direct from the producer to the consumer in the city. This is quite common and especially popular in the suburbs and along the highways leading into San Juan (fig. 4).

Direct receipts accounted for 694,013 tons, or 89.5 percent of the total product handled. Table 1 shows the volume of receipts and amount of movement between operators in San Juan in 1962.

TABLE 1.—*Volume received direct and transferred, and total handled by wholesale food operators in San Juan, P.R., 1962*

Type of operator ¹	Direct receipts	Obtained from other dealers ²	Total handled
Fruits and vegetables—	Tons 28,343	Tons 1,269	Tons 29,612
Meat and meat products—	33,074	1,465	34,539
Groceries and other products—	632,596	78,679	711,275
Total—	694,013	81,413	775,426

¹ Further breakdown by products would reveal individual data on certain commodities.

² Reflects all transfers from one operator to another, regardless of reason.

About 10.5 percent (81,413 tons) was handled by more than one dealer.

The average person consumed about 1,450 pounds of food in 1962. Based on this, the wholesale operators in San Juan handled 40.6 percent of the 1.71 million tons consumed on the island.

Sources of Products

Of the 694,013 tons of direct receipts arriving in San Juan, 597,435 tons, or 86.1 percent, were imported. Puerto Rican products accounted for 96,578 tons, or 13.9 percent, of the products received. Table 2 shows the volume of product handled, by type of operator.

Transportation to Market

Products moving into the marketing channels from points outside of Puerto Rico must be transported by ship or by airplane. Once the products arrive, they must be transported by truck to the market areas or operator's place of business, if those facilities are located away from the docks. Where facilities are located on or near the docks, various kinds of mechanical handling equipment, such as fork trucks, are often used to move the product from shipside into the facilities used in marketing.

Because movements of semitrailer containers to Puerto Rico are quite common, there is little need for wholesale firms to be located dockside. As a consequence, only limited usage is made of mechanical handling equipment in moving products from docks to wholesale operators' places of business. This trend is expected to increase rather than diminish in importance because of the use of van containers. Other factors influence the relocation of marketing facilities and will be discussed in a later section on site selection.

⁶ The year 1962 was selected because it was the last year on which data were available at the time of interviews by personnel of the Puerto Rico Department of Agriculture.

TABLE 2.—*Volume handled by wholesale food operators, by source, in San Juan, P.R., 1962*

Type of operator	Imported	Domestic	Received from other operators	Total handled
Fruits and vegetables—	Tons 14,124	Tons 14,219	Tons 1,269	Tons 29,612
Meat and meat products—	31,935	1,139	1,465	34,539
Grocery and grocery products—	551,376	81,220	78,679	711,275
Total—	597,435	96,578	81,413	775,426

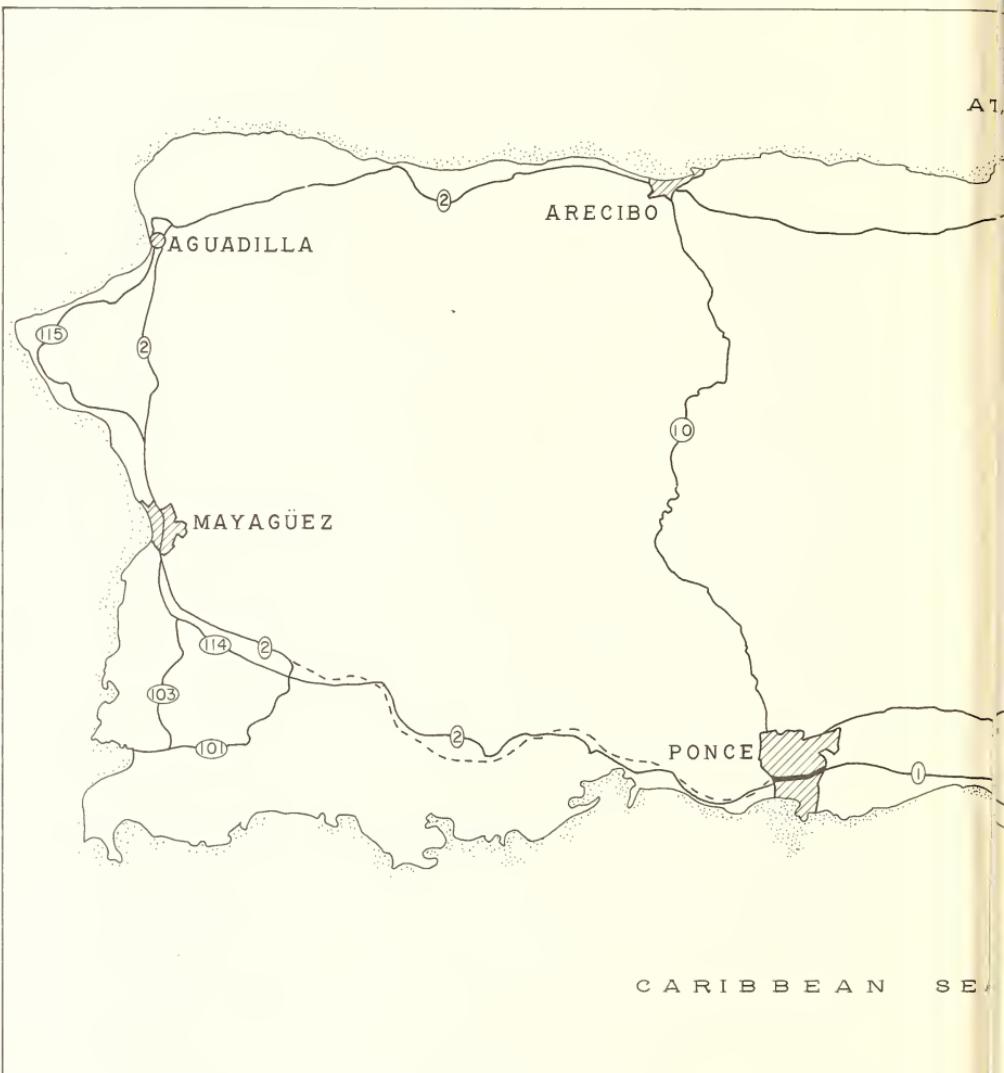


FIGURE 1.—Location of the major cities of Puerto Rico



Puerto Rico and the connecting highway system.

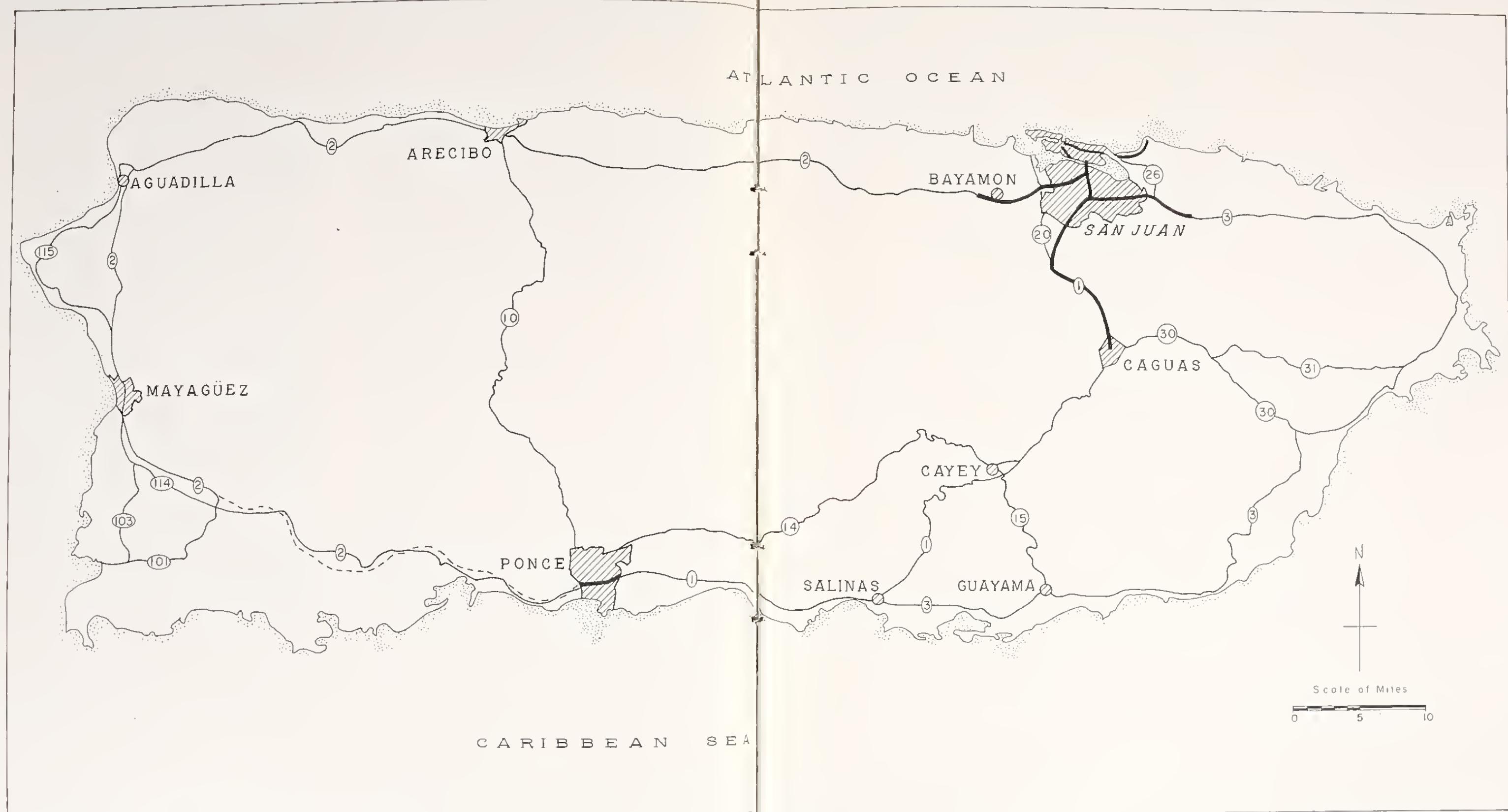


FIGURE 1.—Location of the major cities in Puerto Rico and the connecting highway system.

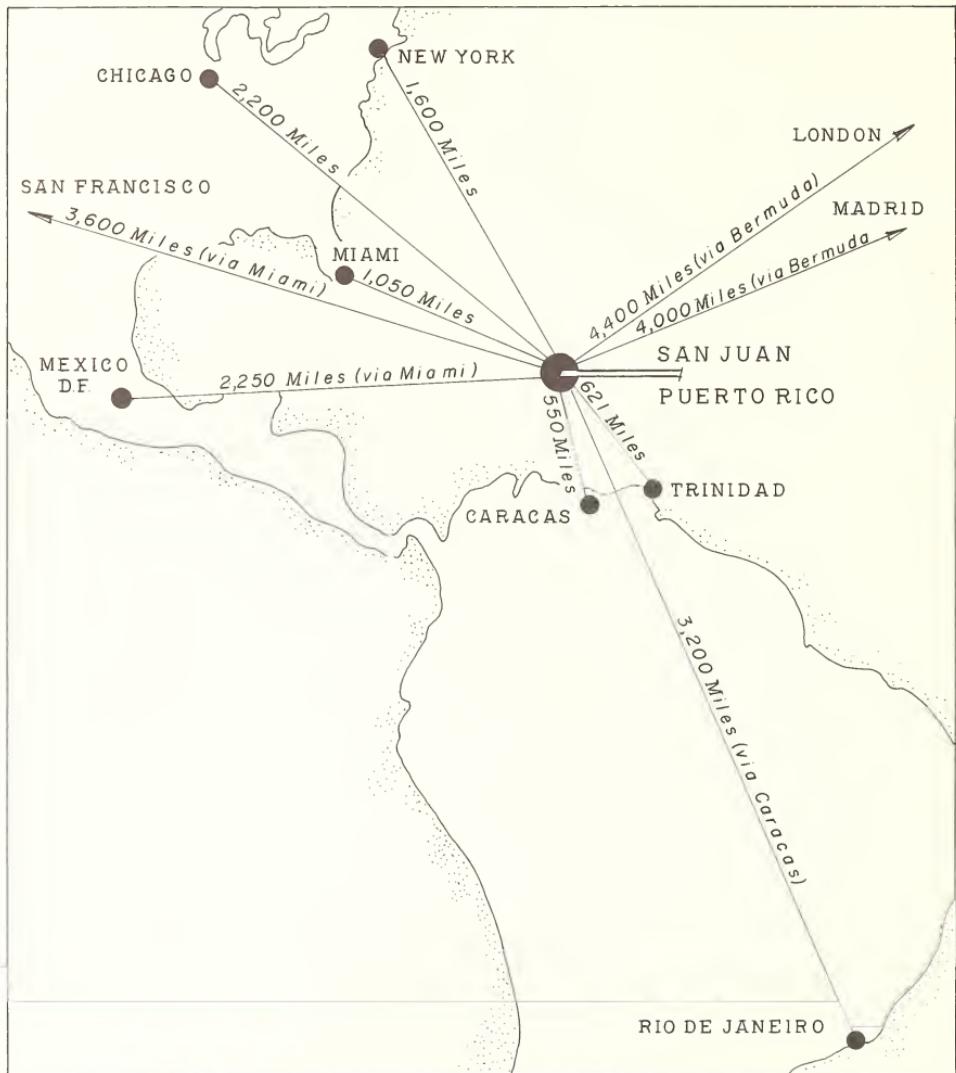


FIGURE 2.—Distances from San Juan to the major cities of the United States and other areas.

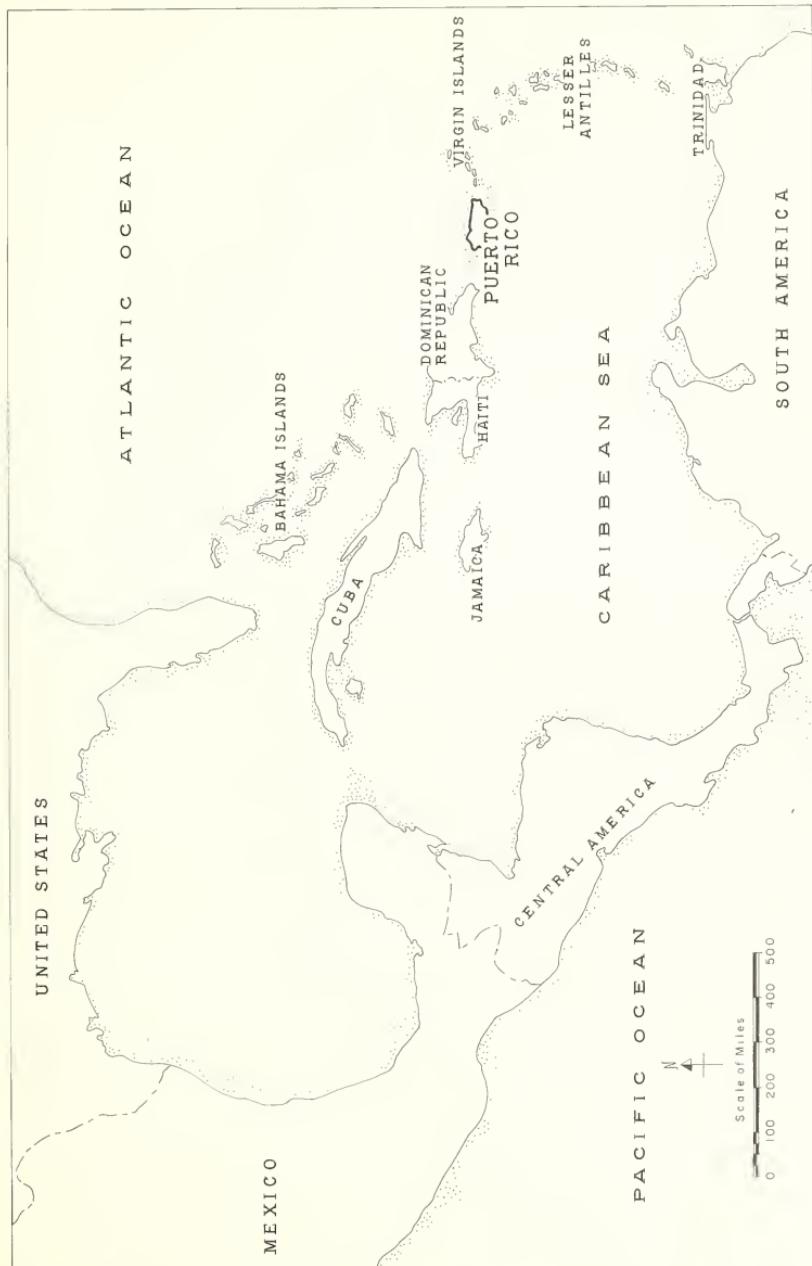


FIGURE 3.—Relationship of Puerto Rico to other areas in the Caribbean.



FIGURE 4.—Vehicle with fresh products for sale parked along a major highway leading into San Juan.

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DESCRIPTION OF PRESENT WHOLESALE FACILITIES AND OPERATION

Food wholesaling facilities in San Juan are characterized by small-volume operators in antiquated and inadequate facilities. Dependence upon hand labor is predominant. Most operators handle a wide variety of products and perform a wide range of functions, but provide few services to the retail outlets that they serve.

Number and Types of Operators

Basic data were obtained from all wholesalers of food commodities, exclusive of fresh dairy products, in the San Juan metropolitan area. An operator was considered a wholesaler when at least 50 percent of the volume handled was distributed to other wholesalers, retailers, or jobbers. Therefore, an operator that distributed occasionally to retail or wholesale outlets, but that conducted primarily a retail business for consumers, was classified as a retail operator and as such is not included in this study.

A total of 83 operators that were classified as wholesalers were operating in the area in 1962. Of these, 16 handled fruits and vegetables, 15

handled meat and meat products, and 52 handled groceries and other products. The large percentage classified as handling groceries and other products reflects the operators handling food products such as seafood, frozen foods, and manufactured dairy products and were so classified to prevent revealing individual data of operators. Table 3 shows the number of operators and the proportion of the total volume handled by various groups of operators in San Juan in 1962.

Over 90 percent of all food products was handled by about 60 percent of the operators and 10 percent was handled by about 40 percent of the operators. The highly specialized operators tended to distribute smaller tonnages.

Many wholesalers of food, especially the small-volume operators, performed many different functions. The same wholesaler frequently performs the functions of importer, wholesaler, jobber, commission agent, and retailer. Despite the wide diversity of functions, few wholesalers provided such characteristic marketing services as extension of credit, product reselling, and storage.

TABLE 3.—*Number of wholesale food operators and percentage of volume handled by each commodity group, San Juan, P.R., 1962*

Type of operator	Operators		Percentage of volume handled
	Number	Percent	
Fruits and vegetables-----	16	19.3	3.8
Meat and meat products-----	15	18.1	4.5
Groceries and other products-----	52	62.6	91.7
Total-----	83	100.0	100.0

Location, Kinds, and Amounts of Facilities

There are several small concentrations of wholesale food operators in the San Juan area. The most important one, the Marina, or port area in old San Juan, contained 46 wholesalers, of which 10 were meat and meat products operators, 3 were fruit and vegetable operators, and 33 were handlers of groceries and other products. Smaller concentrations exist in Santurce, Rio Piedras, and Bayamon. The only major concentration of meat and meat products operators was in old San Juan. Fruit and vegetable operators were scattered throughout the area with the exception of the small concentration in the Puerto Nuevo area.

The most significant factor in the location of food wholesalers was the lack of a well-defined area where a variety of products was handled.

Few of the facilities being used by the wholesalers were designed for the handling operations being performed in them. Many have been converted from other uses. This is particularly true of the facilities in the old San Juan area.

Ownership of Facilities

Only 17, or 20.5 percent, of all operators own all of the facilities that they occupied, 64, or 77.1 percent, rented, and 2 operators used a combina-

tion of owned and rented facilities in performing their business.

In owner-occupied facilities there were 12 wholesalers handling groceries and other products, 4 handling meat and meat products, and one handling fruits and vegetables. Table 4 shows the number of operators owning and renting the facilities which they occupy, by commodity groups.

Space Utilized

Antiquated facilities and buildings that were not designed for the types and volume of product being handled in San Juan wholesale markets characterized the space utilized by the operators handling all types of food products. A breakdown of all space utilized by all types of operators is shown in table 5.

The average amount of refrigerated space used by the 16 fruit and vegetable operators in 1962 was only 384 square feet, and 6 of them had none. Much of the refrigeration equipment that was available was obsolete, antiquated, and inefficient.

The 15 meat and meat product wholesalers used an average of 1,550 square feet of refrigerated space. One operator handled meat products without any refrigeration. In addition to their own refrigerated space, most operators utilized public cold storages during peak periods and some used them continuously. The need for refrigerated space for handling meat and meat products seriously limited the inventory that operators could carry.

On the average, grocery operators utilized about twice the amount of space used by other operators. They maintained larger offices and used considerably more space for storage of product, largely because of slower inventory turnover. The 52 grocery operators used three-fourths of the total floor space in 1962 and over half of the total refrigerated space.

The 83 wholesale food operators utilized 83,000 square feet of office space, 639,835 square feet of operating space, and 63,484 square feet of refrigerated space in their operations, a total of 786,627 square feet of floor space. On a percentage basis, 8.1 percent of all space was refrigerated, 81.3 per-

TABLE 4.—*Tenure status of wholesale food operators in San Juan, P.R., 1962*

Type of operator	Own		Rent		Own-rent ¹		Total	
	Number	Percent of type	Number	Percent of type	Number	Percent of type	Number	Percent of total
Fruits and vegetables-----	1	6.2	13	81.3	2	12.5	16	19.3
Meat and meat products-----	4	26.7	11	73.3	-----	-----	15	18.1
Groceries and other products-----	12	23.1	40	76.9	-----	-----	52	62.6
Total-----	17	20.5	64	77.1	2	2.4	83	100.0

¹ Wholesalers that operated in facilities of which they owned part and rented part.

cent was operating space, and 10.6 percent was office space.

Very few operators have platform space of any type and for the limited number who do, it is usually at street level, narrow, and not adapted to mechanical handling of products (fig. 5). Be-

cause of the restricted amounts, no separate breakdown of platform space was made. Likewise, no breakdown of the number of floors was made because a majority of the operations are performed on one level and most facilities have no usable basements.

TABLE 5.—*Space used by wholesale food operators, by type of use, San Juan, P.R., 1962*

Type of operator	Operators	Space							
		Office		Operating ¹		Refrigerated ²		Total	
		Total	Average per operator	Total	Average per operator	Total	Average per operator	Total	Average per operator
Fruits and vegetables	Number 16	Sq. ft. 3,888	Sq. ft. 243	Sq. ft. 94,770	Sq. ft. 5,923	Sq. ft. 6,142	Sq. ft. 384	Sq. ft. 104,800	Sq. ft. 6,550
Meat and meat products	15	12,425	828	57,680	3,845	23,328	1,550	93,433	6,228
Groceries and other products	52	66,995	1,288	487,385	9,373	34,014	654	588,394	11,315
Total	83	83,308	1,004	639,835	7,709	63,484	765	786,627	9,477

¹ Space on all floors exclusive of office and refrigerated or cold storage areas.

² Does not include air conditioned areas above 50° F.



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FIGURE 5.—Lack of platform space is evident almost everywhere food and related products are handled.

Transportation

Many motor vehicles are used daily in receiving, handling, and distributing food in San Juan. Because of the lack of well defined market areas, no attempt was made to enumerate the number and types of vehicles used. Vehicular traffic in the dock and pier areas is greatest at the time cargoes are being unloaded from ships arriving in the port. However, the concentration has been eased somewhat by the use of containerized vessels and modernized methods of handling.

It is quite obvious to the casual observer that an enormous amount of labor is used inefficiently in the market areas because of the amount of waiting time for vehicles both in the pier areas and in the areas where wholesalers operate.

Vehicular traffic problems are a result of several things. Streets in the marketing areas are narrow, oftentimes winding, and crowded (fig. 6). Compounding the problem of narrow streets are the vehicles themselves. They are not only more numerous, but much wider and longer than those in use when the streets were planned, and they move a much greater volume of merchandise.

Because wholesale markets and retail markets are intermingled, pedestrian traffic is also heavy during operating hours. All merchandise must be moved by motor vehicles, because rail facilities are either unavailable or uneconomical to use. One transportation firm uses railroad cars as product containers, but there are no facilities for handling these cars away from the unloading area in the vicinity of the old airport.

Parking areas are limited and evidence a severe lack of planning. Buyers, employees, and others whose business requires them to frequent the wholesale markets of the city are constantly faced with a parking problem. Vehicles and pedestrians not associated or allied with the food business also crowd the areas.

Public Markets

Several local public markets are operating in the metropolitan area. The major activities in these markets are retail, although a few wholesalers operate in them and some are located close to a wholesale market area. The facilities used by these markets are inadequate, poorly designed, and crowded. Because these facilities are mostly



FIGURE 6.—Narrow streets are evident in the wholesale areas in San Juan.

used by retailers, they will not be described, nor will any solutions be offered for their improvement. Planning for improvements in the Rio Piedras market is underway by the city of San Juan. The wholesalers connected with or located close to these areas have been included in the analysis of wholesale operations. A description of public markets may be examined in the report cited in footnote 2, page 1. Operations in these markets were included if at least 50 percent of the volume of product handled moved in the wholesale channels.

Food Chains

Since the report mentioned above was published, food chains have been successfully introduced in the San Juan area. Three organizations that could be classified as food chains are operating at the present time. Two of these are corporate entities, and one is a voluntary association that performs as a chain organization. The chains are popular in Puerto Rico and it seems reasonable that their growth will continue. Because of the limited number of chains, no separate treatment of these firms will be made. Instead, they have been included in the classification of groceries and other products for purposes of this analysis.

Cold Storage Warehouses

Most of the cold storage warehouses in the San Juan area are obsolete, inadequate, and inefficient, but they play an important role in wholesale food operations, especially for perishable items, because much of the food distributed in San Juan is imported and, as a result, arrives in large quantities that must be distributed over a period of time. Large inventories must be maintained in the event of a delay in receipt of an expected shipment. Wholesalers have only limited refrigerated facilities and, as a result, carry only a small inventory of perishables on their premises. They make extensive use of the cold storage warehouses on the many occasions when their supplies exceed their normal inventory requirements.

In 1962 there were 11 public cold storage ware-

houses in the San Juan metropolitan area. These warehouses contained 1,640,600 cubic feet of space.

The warehouses are of concrete, frame, and combination concrete and frame construction and are one or two stories high.

Much of the equipment used is obsolete, inadequate, poorly designed, and improperly operated. Handling methods, inventory control systems, and lack of adequate loading and unloading space make the use of these facilities an inefficient and time-consuming operation.

Processing Facilities

Processing facilities for livestock, grain products, and other agricultural products such as pineapple and sugar are important to the economy of the entire island. These plants are outside the metropolitan area, with the exception of the grain elevator and milling facility. Neither of these will be analyzed, although they play an important part in the wholesale markets of the city.

Improved livestock slaughtering facilities were recommended for the San Juan area in the report published by the U.S. Department of Agriculture in 1951. The basic recommendation called for a plant capable of slaughtering about 12 to 14 cattle and about 25 hogs per hour. A plant capable of slaughtering 30 cattle and 60 hogs per hour was constructed in Caguas and has operated only periodically since it was opened for business in 1961.⁷ In addition to the livestock slaughtering and processing portions, the plant has a poultry dressing division that has been in continuous operation since opening in January 1961. *Every attempt possible should be made to get the livestock slaughtering plant into full operation.* This study did not encompass this problem, which appears to be quite complex and should be investigated.

The grain storage and mill operation apparently is operating at an acceptable level and should provide excellent results in the future. This operation was not covered by this study, nor were the facilities for handling and processing sugar, pineapple, and other agricultural products.

FLOW OF PRODUCT THROUGH THE WHOLESALE MARKETS

The flow of food products into San Juan and through the distribution channels of the island is complex. Imports and exports move largely by water. Air transportation is used for some highly perishable or high valued commodities, but is limited mainly by the high cost at present. All movements in San Juan and on the island are made by motor vehicles as there is no active public rail carrier.

Total Volumes Handled and Flow

The movements shown in figure 7 include all food commodities and are based on information obtained from all known wholesale food operators, the Market News Services of the U.S. Department of Agriculture, and various agencies of the Com-

⁷ NEW PUERTO RICO PLANT SHOWS DETAILED PRODUCTION PLANNING. Meat, February 1961, pp. 46-49.

MOVEMENT OF ALL FOODS THROUGH THE
WHOLESALE MARKETS
San Juan, Puerto Rico, 1962
(Tons)

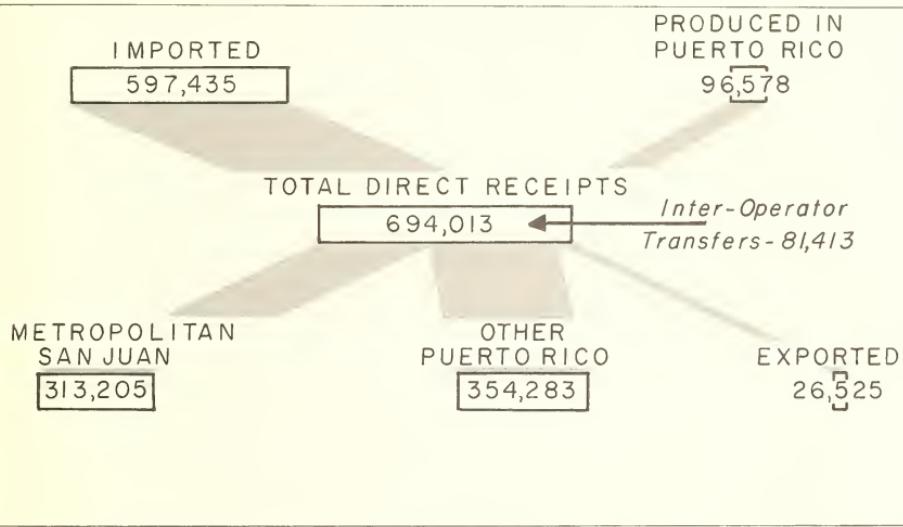


FIGURE 7

monwealth of Puerto Rico. Extensive examinations of records of operators' receipts and deliveries and of transportation firms and interviews with selected cold storage operators also were used in compiling the movement data in this report.

Of the 775,426 tons of product handled by the 83 operators, 77.0 percent was imported, 12.5 percent was produced in Puerto Rico, and 10.5 percent was purchased from other wholesalers in San Juan.

A total of 354,283 tons, or 45.7 percent of all products handled by San Juan wholesale food operators, were distributed outside the metropolitan area of San Juan. This indicates that the San Juan wholesale operation is of vital importance to the entire island. The wholesale operators distributed 313,205 tons of product, or 40.4 percent of all the tonnage they handled, within the San Juan area. This is in addition to the 81,413 tons, or 10.5 percent, sold to other wholesale operators. Only 3.4 percent was exported from the island. A high percentage of this was locally produced products moving from Puerto Rico to

the United States and products arriving from the mainland for reexport to the Virgin Islands and other points in the Caribbean.

Slightly over half of all direct receipts of 16 fruit and vegetable operators was produced on the island and about 48 percent was imported. Nearly 47 percent of the total volume handled was distributed in Metropolitan San Juan in 1962, 36 percent was exported, 4.3 percent was distributed to other wholesale operators in the city, and 13 percent was distributed outside of San Juan.

Movements of the three groups of food are shown in figure 8.

The movement of 33,074 tons of direct receipts of meat and meat products, of which 96.6 percent was imported, points up the need for improved slaughtering and processing facilities mentioned earlier. The 15 meat and meat product wholesalers handled a total of 34,539 tons of product in 1962, including transfers of 1,465 tons. Of the total of 34,539 tons of meat and meat products handled in the wholesale markets, 49.2 percent was

MOVEMENT OF 3 FOOD GROUPS THROUGH THE WHOLESALE MARKETS
 San Juan, Puerto Rico, 1962
 (Tons)

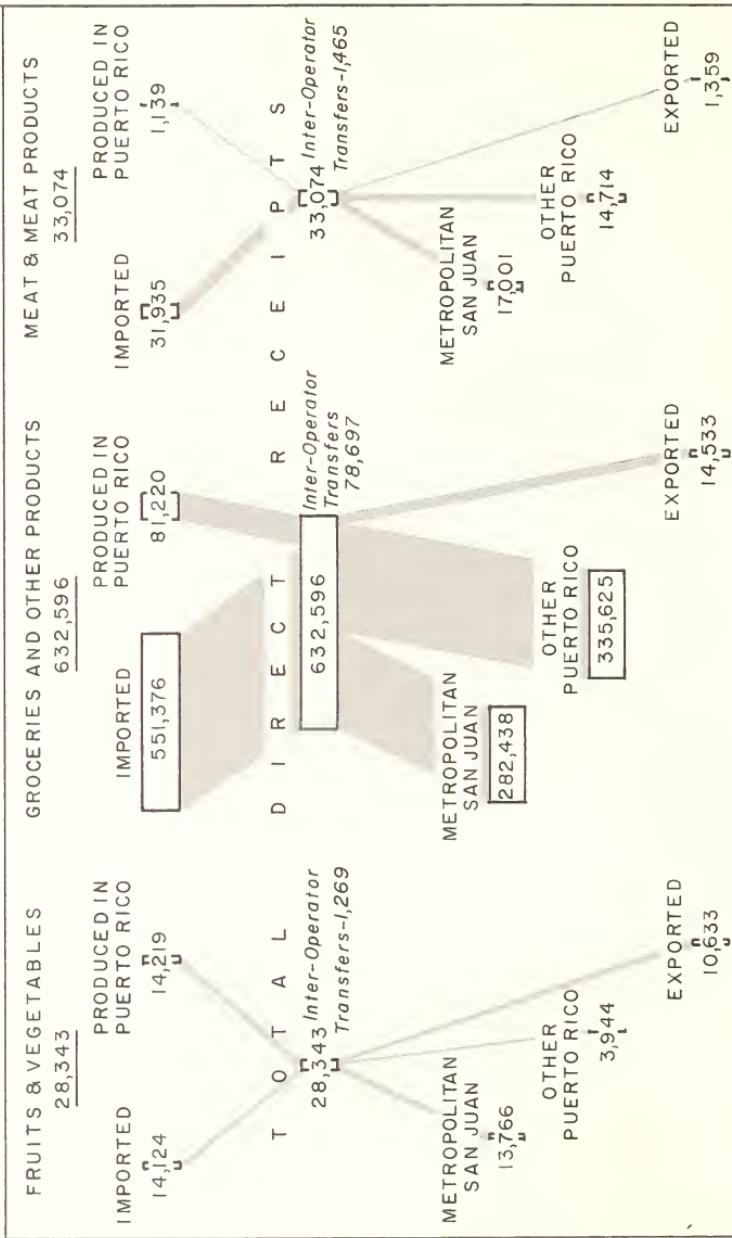


Figure 8.

distributed in San Juan, 42.6 percent was moved to other points in Puerto Rico, 4.2 percent was sold to other operators in San Juan, and 4.0 percent was exported to other islands in the Caribbean area.

Fresh meat consumption patterns in Puerto Rico are very different from those on the mainland. Much of the fresh meat consumed is actually slaughtered and delivered direct to the retailer the same day and as a result is not reflected in the wholesale volumes. This practice may be due to the lack of proper refrigeration or to custom, but improvements in refrigeration and the breaking down of the custom is evident in the new supermarkets which are operating in San Juan along the conventional patterns in the United States.

The movement of products classified as groceries and other products follows a pattern similar to that of the other commodities but involves a much greater tonnage. The 52 groceries and other products wholesalers handled 711,275 tons of product in 1962 of which they received 88.9 percent direct and 11.1 percent from other operators. Of the direct receipts, 87.2 percent was imported and 12.8 percent was obtained from local sources.

In distributing the 711,275 tons of groceries and other products, 39.7 percent was distributed in San Juan, 47.2 percent was distributed to other Puerto Rico points, 11.1 percent was shipped to other wholesalers in San Juan, and 2.0 percent was exported (primarily to other islands in the Caribbean). Movements of groceries and other products are shown graphically in figure 8.

Transfers of Product

Transfers of products between wholesalers include transfers in the same market and from one market area to another.

A total of 81,413 tons of food products, or 10.5 percent of all products handled, was sold to other

operators in San Juan by operators in San Juan. This included 78,679 tons of groceries and other products, 1,465 tons of meat and meat products, and 1,269 tons of product classified as fruits and vegetables. As noted from the above figures, the major portion of the transfers, like volume handled, was grocery and grocery products.

Average Volumes Handled

The average volume of products handled reflects the total volume handled by all operators and not just the volume received direct. All volumes transferred were double handled or handled in at least two operators' places of business.

The average volume handled by the 83 operators in 1962 was 9,343 tons. The 16 fruit and vegetable operators handled an average of 1,851 tons, the 15 meat and meat product operators handled an average of 2,303 tons, or about 25 percent more than the fruit and vegetable operators, but the 52 groceries and other products operators handled an average of 13,678 tons.

Distribution of Product

Products arriving in San Juan are distributed throughout Puerto Rico and the surrounding islands in the area. This is especially true of groceries and other products.

San Juan operators delivered 397,976 tons, or 51.3 percent, of all products handled, and 350,925 tons were picked up by the purchaser at the operator's place of business. A total of 26,525 tons was reloaded on air or water transport for shipment away from the island.

Wholesale operators delivered 54.4 percent of the fruits and vegetables handled, 83.8 percent of the meat and meat products handled, and 49.6 percent of the groceries and other products handled.

SELECTED COSTS INCURRED IN HANDLING

San Juan is a market of contrast, as some of the most efficient handling methods, as well as some of the most inefficient methods, may be found in the city. The use of modern, efficient handling methods is extremely limited and is rendered ineffective because it is associated with the inefficient ones. The preponderance of inefficient facilities is costly to producers, consumers, and market operators.

Selected costs in this report are confined to those incurred from the first point of arrival in the metropolitan area (except for locally produced volumes where the first point of arrival is considered the operator's facilities) until the product is delivered to retail outlets in the city or is loaded

onto vehicles for movement out of the area or for export. They do not include the costs of transporting from production areas, the United States, or other originating point to San Juan, nor do they include the costs of transporting the products to outlying points in Puerto Rico.

Information was assembled on costs of all known operators; however, only limited success was achieved in obtaining complete information, because many operators had inadequate records and some were reluctant to divulge their data. Where possible, checks on both volumes and costs were made by using information obtained from public agencies, truck operators, transportation firms, and operators of service facilities. At no

time have individual data been divulged to any one for any reason, and care has been exercised to prevent that in this report.

Costs included are: Labor cost and fringe benefits paid employees for unloading, handling, loading, and shipping out; transportation cost to move product to stores and away from stores in the markets, including delay cost; rentals paid, either actual, or estimated in the case of ownership; other handling costs such as those for cartage; and estimated deterioration, pilferage, and theft caused by inadequate facilities.

Processing costs, such as sausage manufacture and manufacture of frozen ready-to-cook items, are excluded because of the small number of processing operations and the wide divergence among those that do exist. Normal cutting costs for preparation of wholesale cuts of meat are included. Handling cost for all processed items is included.

The costs of electricity, telephone, management other than supervisory, transportation to the market from production points, and transportation away from the market areas for products moving into export or outside Metropolitan San Juan are not included. These costs will remain about the same, whether the operators remain at present locations or move elsewhere in the city.

Handling Costs

Handling costs, as used herein, include those costs incurred by the operators between the time they physically acquire the product until its movement from their place of business. These costs include, but are not limited to, labor in unloading, movement into the facilities, and movements within the facilities, such as sorting, order assembly, restocking, and preparation for shipment. When contract carriers or outside truckers assisted in unloading or loading, an estimate of their time was included when handling costs were computed. No processing costs are included.

Handling the 775,426 tons of products was estimated to cost \$2,097,947, or about \$2.71 per ton. Costs of handling are shown in table 6. On a per-ton basis it cost almost three times as much to handle meat and meat products as it did to handle grocery and grocery products. On the average it cost \$6.97 per ton to handle meat and meat products, \$4.35 to handle fruits and vegetables, and \$2.43 per ton to handle grocery and grocery products in the facilities being used in 1962 in Metropolitan San Juan. Handling costs in Puerto Rico are considerably less than in the United States because of the lower prevailing labor rates for the type of labor required. Fewer skilled laborers

are required because much of the preparation and packaging has occurred prior to receipt in Puerto Rico.

TABLE 6.—*Estimated costs of handling 775,426 tons of food through the wholesale food facilities in San Juan, P.R., 1962*¹

Type of operator	Volume handled	Costs	
		Per ton	Total
Fruits and vegetables	Tons 29,612	Dollars 4.35	Dollars 128,812
Meat and meat products	34,539	6.97	240,737
Groceries and other products	711,275	2.43	1,728,398
Total	775,426	2.71	2,097,947

¹ Does not include costs of transferring products purchased by San Juan wholesale operators from other San Juan operators.

Handling costs vary considerably among commodity groups because of differences in handling methods and techniques as well as the nature of the product being handled.

Movement Between Operators

For the wholesale markets to function properly, it is necessary and entirely normal for a sizable percentage of product handled to be transferred to other operators. An operator may order more or less than he requires because he over- or underestimates his demand. Specialization by operators tends to increase the amounts of products transferred. Some firms tend to rely on others for their reserves. In other cases, improperly designed facilities, inadequate storage space, poor utilization, and split operations tended to increase the amount of movement between operators.

A total of 81,413 tons, or 10.5 percent of the total volume of products handled, were handled by more than one operator. In a market such as San Juan, where a large percentage of the products are imported, this is probably not unreasonably high, although it would be desirable to reduce the amount by better scheduling, improved inventory control, and better storage facilities. Average costs of movement between operators were \$3.76 per ton for fruits and vegetables, \$4.43 per ton for meat and meat products, and \$1.98 per ton for groceries and other products. The average cost for all products was \$2.05. A complete breakdown, showing the tonnage, average costs, and total costs is shown in table 7.

TABLE 7.—*Estimated costs of transferring 81,413 tons of food between operators in San Juan, P.R., 1962*

Type of operator	Volume transferred	Costs	
		Per ton	Total
Fruits and vegetables-----	Tons 1,269	Dollars 3.76	Dollars 4,771
Meat and meat products-----	1,465	4.43	6,490
Groceries and other products-----	78,679	1.98	155,784
Total-----	81,413	2.05	167,045

Spoilage, Deterioration, and Theft

Problems of excessive spoilage, deterioration, and theft of product abound in and around the wholesale marketing facilities in San Juan. The costs of these losses are excessive because of inadequate facilities, lack of refrigeration, and poor handling practices and methods.

Costs of spoilage, deterioration, and theft were estimated for each of the commodity classifications. Wholesale operators estimated the amounts and value of the combined losses. Losses were considerably higher than in comparable size cities that have been studied in the United States. Losses are lower than a cursory examination might indicate, as many items which might be discarded as commercially unsalable often were partially salvaged and sold at reduced prices. This was particularly true of fresh fruits and vegetables.

Total losses attributable to spoilage, theft, and deterioration in 1962 were estimated at \$1,817,750, or \$2.34 per ton handled. Although the average losses from these sources are least for groceries and other products, the total losses are greatest for this group because of the high volume of products classified as such (table 8).

TABLE 8.—*Estimated costs of spoilage, deterioration, and theft of food handled by wholesale operators, San Juan, P.R., 1962*

Type of operator	Value per ton	Estimated percentage of loss	Loss per ton	Volume handled	Total loss
Fruits and vegetables-----	Dollars 400	1.75	Dollars 7.00	Tons 29,612	Dollars 207,284
Meat and meat products-----	1,000	.75	7.50	34,539	259,043
Groceries and other products-----	380	.50	1.90	711,275	1,351,423
Total or average-----	408	.57	2.34	775,426	1,817,750

Rents

Rental data were collected from all wholesale operators in Metropolitan San Juan. Most operators rented the facilities that they occupied, but if the operators owned the facilities an estimated rental value was determined both by asking what the rental value was and by comparing rentals of similar facilities in the same area.

Meat and meat products operators, as expected, paid the highest rentals per square foot of space occupied. On a square foot basis, these operators paid an average of \$2.22, groceries and other products operators paid \$0.58, and fruit and vegetable operators paid \$0.55. On the average, all operators paid \$0.77 per square foot of space occupied. Table 9 shows total rentals, rentals per square foot, and amount of space occupied, by commodity groups.

TABLE 9.—*Estimated costs of rentals for wholesale food operators in San Juan, P.R., 1962*

Type of operator	Space occupied	Costs	
		Per square foot	Total
Fruits and vegetables-----	Sq. ft. 104,800	Dollars 0.55	Dollars 57,640
Meat and meat products-----	93,433	2.22	207,421
Groceries and other products-----	588,394	.58	341,269
Total-----	786,627	.77	606,330

Summary of Total Costs for Selected Items

Estimates of selected costs for handling 775,426 tons of food products through the wholesale facilities in San Juan totaled \$4,689,072, or an average of \$6.05 per ton of product received and shipped. The total estimated costs for handling meat and meat products were \$713,691, or an average of

\$20.66 per ton; for fruits and vegetables \$398,507, or \$13.46 per ton; and for groceries and other products \$3,576,874, or \$5.03 per ton. Detailed break down of costs, by items and commodity groups, is shown in table 10.

Nonmeasurable Costs

Poor sanitation, dirty facilities, poor working conditions, lack of adequate safety precautions,

the effect of long operating hours on other costs, and the inconveniences caused by poor facilities and traffic congestion, for operators as well as buyers and other groups doing business, add to the total costs of distributing food products from present facilities. The costs of these deficiencies are hard to measure and were not determined in this study, nor were the costs to the city for traffic control, police, and fire protection considered.

TABLE 10.—*Summary of selected costs for wholesale food operators for handling 775,426 tons of food in San Juan, P.R., 1962*

Type of operator and cost item	Volume handled	Costs	
		Per ton	Total
	Tons	Dollars	Dollars
Fruits and vegetables:			
Handling	29,612	4.35	128,812
Transfer	1,269	3.76	4,771
Spoilage, deterioration, and theft	29,612	7.00	207,284
Rentals	29,612	¹ 1.95	57,640
Total	29,612	13.46	398,507
Meat and meat products:			
Handling	34,539	6.97	240,737
Transfer	1,465	4.43	6,490
Spoilage, deterioration, and theft	34,539	7.50	259,043
Rentals	34,539	¹ 6.01	207,421
Total	34,539	20.66	713,691
Groceries and other products:			
Handling	711,275	2.43	1,728,398
Transfer	78,679	1.98	155,784
Spoilage, deterioration, and theft	711,275	1.90	1,351,423
Rentals	711,275	¹ .48	341,269
Total	711,275	5.03	3,576,874
Total all commodities	775,426	6.05	4,689,072

¹ Rentals in table 9 were converted from square-foot costs to costs per ton.

DEFECTS IN THE WHOLESALE MARKETING FACILITIES IN SAN JUAN

Most of the defects in the wholesale marketing of food may be attributed directly or indirectly to the facilities being used in handling the products.⁸ Most of the defects are reflected in high costs of operation. In the preceding parts of this report, many of the defects have been mentioned directly and others only indirectly. A clear understanding of them is necessary to the consideration of proposed means and methods for improving the marketing operation.

Inadequate Facilities

Although a few facilities have been renovated in the last few years, many are not suitable for modern and efficient handling of food products. Most facilities are expensive to operate and unsanitary as well. Many of the facilities being used by the wholesale operators were not designed for modern handling methods. Few can be economically adapted to modern methods.

Much of the product moving into operators' facilities must pass through the same doorway when moving out of the facilities to retail or other outlets, as many have only one entrânce.

⁸ Facilities as used here include the equipment as well as the physical structures used in handling food products and range from refrigeration equipment to hand tools used in blocking meat.

Many of the facilities lack adequate planned storage areas, and most are crowded. Floors are poorly constructed, sometimes of materials not acceptable by sanitary standards. Few can be properly cleaned and otherwise serviced. The main floors of most facilities are at street level. Few have truck-bed level platforms, and this causes unnecessary movement and handling. Some products are literally worn out by the repeated handling operations, which are numerous for imported products under the best of conditions. Only a few facilities have adequate standing space for loading and unloading; most have none, and as a result, use the streets and sidewalks.

The electrical service, sewerage facilities, water, ventilation, and air circulation do not meet the needs of the operators. It is not practical nor economical to make the adjustments necessary to meet these requirements in most of the present facilities.

Many operators occupied facilities at more than one location to have enough space for their business. Others occupied space below street level to perform their entire operations. Little or no area is available for expansion near or adjacent to many of the facilities.

Facilities in the market that were used for handling perishable food commodities often had inadequate refrigeration or none. Few had proper equipment for humidity control. Proper humidity controls in some facilities have more than offset their cost by reducing shrinkage of fresh meats and prolonging the shelf life of other perishables such as fruits and vegetables.

Inadequate facilities contribute more to high costs of operation in the markets than any other single factor, primarily because of the extra labor required for performing jobs that could be done much more easily, cheaply, and simply with adequate facilities. Both the size and shape of many facilities are inadequate for the operations being performed in them. Some operators do not use the space they have to the best advantage; for many, there is no good way.

Lack of Adequate Streets and Parking Areas

Next to inadequate facilities, the lack of adequate streets and parking areas contributes more to the inefficiencies of the wholesale marketing of food in San Juan than any other single defect. This is especially true because of there being no rail facilities, so all products must come into as well as leave the markets by motor vehicles.

Streets in Metropolitan San Juan were designed for vehicles much smaller, lighter, and less powerful than those in common usage in the city today. The streets are not wide enough and the

traffic is too congested for the 35-foot trailers and other large vehicles that are used in moving food into and out of the facilities, especially in old San Juan. Most streets have only one lane available for moving vehicles, and often during business hours trucks have long waiting periods because loading and unloading operations are being performed in the streets.

Practically all facilities used for marketing food at the wholesale level lack adequate space for parking vehicles of buyers, employees, operators, shippers, and others using them.

Tailboard space at loading areas is hopelessly inadequate. Most buildings do not have adequate rear entrances and all loading and unloading at these stores must be done through the front entrances. Where trucks are parked parallel, the number that can be loaded or unloaded at any one time is extremely limited. Only a few units possess facilities where loading and unloading operations can be performed simultaneously. Traffic control is impossible with the streets and parking areas that must be used, nor is it possible to schedule the loading and unloading operations, because of the wide variations in times required to move from one place to another.

Poor Working Conditions

The wholesale market areas of San Juan are not pleasant places to work. But, manual labor must still be used instead of modern handling equipment because few of the facilities were planned or are adaptable for modern mechanical handling methods.

Adequate and clean restrooms are not available for most employees in the food marketing facilities throughout the city. Many of the toilet facilities are dark, dirty, and poorly equipped. Few meet modern standards, nor is that possible for most of them because of their construction, size, and location within the facilities.

Many facilities have crowded and dirty work areas, few have proper equipment for cleaning, and many are impossible to clean even if proper equipment were available. Working hours are long, and the lack of coordination causes the markets to open early in the morning to make shipments and remain open late to prepare for the next day's business. Long hours, overtime, double shifts, and staggered shifts are common.

The general environment is depressing, not only to the employees, but to visitors and others who frequent the markets. Many of the buildings are old, weather worn, and in poor repair. Garbage, trash, and refuse are often placed in or near the streets, causing unnecessary odors and congestion.

Employees loading and unloading vehicles are often exposed to sun and rain. Even though the

weather is usually mild throughout the year, some protection should be provided.

Wharf Facilities Inadequate

Wharves built for service a number of years ago are not compatible with present day handling methods or with the volume of products being handled. The problem of inefficient wharves and dock facilities is further complicated by the greatly increased volume of shipments to and from the island (fig. 9).

Drastic changes have begun to occur in the conventional methods used in handling products transported by water. Additional facilities have been constructed or are under construction to increase the efficiency of these operations, especially in the Puerto Nuevo area of the city. When these facilities are completed, San Juan will have one of the most efficient port facilities in the world. Tonnage shipped by containerized vessels will probably increase substantially during the next few years.

Because a large part of the food and other products being imported into Puerto Rico moves by semitrailer type containers, considerable improvement may be expected in the time and cost of getting ships unloaded and loaded, and greater use may be made of the improved facilities. As a

result, the conventional port facilities will probably not be as crowded or congested.

More segregation of products will be possible and the confusion from mixed types of cargoes will be lessened. The mixing of perishables and nonperishables, although necessary to some extent, will not be as pronounced when containerized shipments are used extensively.

Lack of Concentrated Market

One of the major defects that creates much inefficiency in the wholesale markets in San Juan is the lack of a concentrated wholesale market. The closest approximation is in old San Juan, but because of the narrow streets, poor location, inadequate facilities, and the lack of grouping of similar kinds of wholesalers, this area is extremely ineffective in performing the functions of a concentrated market. An assembly market for export products is nonexistent. The lack of a concentrated market affects everyone concerned with the wholesale markets in Puerto Rico, including buyers, sellers, consumers, wholesalers, and service and transportation agencies.

The situation regarding the lack of a concentrated market has changed very little since the Department of Agriculture published its report on San Juan in 1951. In fact, the situation may



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FIGURE 9.—Lack of parking for vehicles and maneuvering room for trucks in area adjacent to the pier where food products are received in San Juan.

have increased in intensity because a much greater volume of product is being handled.

Buyers are unable to purchase all of their needed supplies in one market because no one wholesale operator handles a full line of the products, especially both locally grown and imported. The scattered locations of wholesale operators cause much unnecessary rehandling, transporting, and movement of product. In addition to the extra cartage costs, unnecessary spoilage, product deterioration, and traffic congestion caused by the facilities in scattered locations, it is extremely difficult for prices to be established efficiently.

Many operations are split between widely scattered locations, which increases the costs of handling, increases the possibilities of pilferage and thefts of product, and reduces the amount of supervision of employees and operations.

All of the inefficiencies of the market caused by the scattered locations throughout the city are reflected in high operating costs to the wholesalers who in turn must reflect these in higher priced products to the consumer.

Lack of Farmers' and Truckers' Facilities

With the exception of a limited amount of space available in the public retail market areas, there are no facilities available for farmers and truckers. As a result, they operate on streets and highways in and around San Juan. Nonregulated operations by farmers and truckers present not only a health hazard, but also a safety hazard, especially along the public expressways.

The limited space available in the market areas affords little protection to the products offered for sale, and many farmers and truckers can find no space in which they can operate effectively and efficiently.

Lack of Market Regulation and Enforcement

No definite hours of operation are applicable to all wholesale food operators and businesses serving the wholesale food industry. Some wholesalers maintain almost 24-hour operations, while others are open only a few hours each morning. The public markets that service retail buyers primarily are more exact and correspond mainly to the normal working hours.

A wholesale market consists of many different types of operations and businesses. It must function as a unit if it is to serve a distribution area efficiently. Individual operators should have a maximum degree of freedom in the conduct of their business, but they, as well as the firms patronizing and servicing the markets, usually find

it to their mutual advantage to establish a few regulations for all to observe.

Where various segments of a market are scattered, as in San Juan, it is practically impossible to have a common organization to enforce any regulations governing market operations and practices. The wholesale facilities in San Juan are on public streets, many times on thoroughfares, where it is not possible to control traffic for the benefit of the operators or to regulate the hours of operation. The lack of established selling hours means longer work days, often excessive exposure of perishable products to high temperature, and greater fluctuations of price throughout the selling periods. Without definite market hours, buyers and others serving the operators do not know when to arrive in order to find the largest variety and highest quality of produce. Regulations are needed to maintain sanitation, policing, fire protection, and other services provided by the municipality.

Lack of Assembly Points and Facilities for Export Commodities

San Juan and all of the production areas of Puerto Rico lack adequate facilities for assembling and preparing food commodities other than one or two highly specialized items for the export market. Many export products are improperly prepared, packaged, and presented for shipment and do not arrive at their final destination in the best possible condition. Facilities for assembling, packaging and preparing for shipment, such as precooling, are not adequate and it seems unreasonable to expect much growth in the export trade until adequate provision is made for supplying the services required by the export market for perishable and prepared foods and food products.

Perishable fruits and vegetables should be precooled prior to presentation for loading in shipping containers. Improvements in the quality of product and preparation for marketing could substantially increase the income of the agricultural segment of the Puerto Rican economy. Properly constructed and located facilities should service both the import and export requirements.

Improper Handling Methods

In present facilities much labor is required and only limited usage can be made of handling equipment such as fork trucks and conveyors. Often-times, perishable products are transported in open vehicles exposed to high temperatures and rain, or with only a tarpaulin for protection. Stacking operations often mean merely piling, and food is walked on, mashed, and otherwise abused in storage.

With economic growth in Puerto Rico, it seems reasonable to expect in the future a more widespread utilization of labor saving devices in handling food. With present facilities it would be economically impossible to adapt the necessary devices to the handling operations.

Results of the Defects

It is impossible to correct all, or even a major part of the many defects of food marketing in present facilities. The defects described above

make the cost of handling food at the wholesale level an unnecessary burden upon the economic system of San Juan and on the entire island of Puerto Rico. Food commodities require handling in facilities that can be maintained in a sanitary condition. As technology advances, the competitive situation of the wholesale operators will be seriously impaired.

The remainder of this report will set forth ways and means of improving the food marketing operation and meeting future demands of the industry.

IMPROVED WHOLESALE FACILITIES

The Puerto Rico Department of Agriculture, the Puerto Rico Department of Commerce, the Puerto Rico Planning Board, the Ports Authority, the municipal government of San Juan, the Agricultural Extension Service of the Commonwealth of Puerto Rico, the Agricultural Experiment Station, and various trade and industry groups all have expressed interest in obtaining improved wholesale marketing facilities for food in San Juan. Many of these agencies have been concerned with the improvement of production practices, the marketing of farm and food products, and the improvement of the dietary habits of the consumers in Puerto Rico. Since the market in San Juan is the principal distribution center and serves, at least in part, the needs of consumers of all the island, the improvement of its facilities, distributive system, and practices becomes of utmost importance to them.

Because of the apparent needs of the wholesale operators, improvements are necessary. In addition, many operators will soon need new facilities, as they must relocate because of renewal, highway, and other public programs for improving San Juan. Changes in transportation and handling methods have also created an interest in improved facilities for the metropolitan area of San Juan.

The only real solution to the defects of the present market is to build complete new facilities of the design, type, and arrangement required to meet

present conditions and, insofar as possible, to anticipate future needs. When operators in all kinds of food are centered in a complete market, buyers and others can come in and get a complete line of products or service a number of firms with one trip. New businesses will be attracted to the area because they can operate efficiently in the improved surroundings.

A center with sufficient acreage and facilities planned to accommodate all food wholesalers, would cause most dealers to want to locate there rather than remain scattered over the city. Even an operator not needing, or desiring, close association with other firms would want to be located where he could service the largest number of customers most efficiently. The same factors that would affect the location of a single wholesale operator would be applicable to a wholesale food distribution center or central market.⁹

It should be pointed out that there have been few successful wholesale distribution centers constructed and operated where some provision was not made to condemn or purchase the majority of facilities that were occupied by the tenants. It is doubtful that the main group of San Juan wholesalers would move unless some provision is made to strongly encourage them to move. Their present facilities could be redeveloped for other industries or uses.

KINDS AND AMOUNTS OF FACILITIES NEEDED

The facilities recommended in this report are based upon the volume and type of foods handled by the wholesale operators who would benefit by moving to new facilities or who, because of city redevelopment and rehabilitation, may be required to move.

In most markets, two types of buildings are needed for the operators: Multiple-occupancy buildings, which would accommodate several oper-

ators; and single-occupancy buildings, each accommodating only one operator.

Studies have indicated that a standard unit of a multiple-occupancy building should be 25 feet wide and 100 feet deep including platforms 15

⁹ The term "wholesale food distribution center" is interchangeable with "central market." The latter term is commonly used in Puerto Rico to mean wholesale food distribution center.

feet deep at both front and rear, and should have either a complete second floor or mezzanine office space, depending upon the products to be handled in them.¹⁰

Single-occupancy buildings are used when they will best satisfy the needs of one operator, or when the operations are such that they can be most economically performed in single-occupancy buildings.

Facilities other than just operating space for wholesale food operators are required, because many of the problems of the present facilities result from other factors such as traffic congestion, inadequate parking, and insufficient loading and unloading space. The design, type, and arrangement of the proposed facilities provide for both buildings and other facilities necessary for the market to function properly.

Plans to improve the wholesale marketing facilities in San Juan should include:

- Buildings for 74 multiple-occupancy units 25 feet wide and 100 feet deep, including front and rear platforms 15 feet deep, with either a second floor or mezzanine office space (depending upon the commodities to be handled); 1 unit would be for a restaurant and 1 unit would be for a bank.

- Two limited-purpose units of a design that would eventually house one or two large firms, but that might be used by several operators at present and in the immediate future.

- Additional office space, a bank, one public restroom area, and at least one restaurant. The restaurant would be on the first floor and the public restrooms on the second floor. Additional office space on the second floor in one building should be for brokers, suppliers, and others associated with the market.

- Paved streets, at least 200 feet wide where buildings face each other, and parking areas for 600 cars and station wagons and 100 trucks, in addition to the tailboard space at the buildings.

- Space for expansion, to permit construction of additional multiple- and single-occupancy buildings as needed.

- Additional facilities allied to a food distribution center, but not included in the complex of structures recommended.

Actual construction should be based upon the space needed by responsible tenants who will sign firm agreements to lease the facilities. Overbuilding at the start of the project should be avoided so that there will be no unoccupied space.

¹⁰These measurements vary slightly from usual recommendations because of the type of buildings proposed. Normally, 14-foot platforms and interior depth of 72 feet would be recommended, but because prefabricated steel buildings, which come in even lengths of 10 feet, are being proposed, this slight change has been made.

Multiple-Occupancy Buildings

The 72 multiple-occupancy units could be placed in 6 buildings. These units are designed for use by operators who need limited amounts of space and also need the cost advantages of multiple-occupancy buildings. These units are designed for all types of operators and are distributed according to the needs as follows: 10 units in 1 building for 16 fruit and vegetable operators, 10 units in 1 building for 15 meat and meat products operators, and 52 units in 4 buildings for 18 grocery and grocery products operators. Each of these units and the adaptations will be discussed in the following sections. A design of a multiple-occupancy building is shown in figure 10.

Multiple-Occupancy Units for Fruit and Vegetable Operators

In the proposed plan, 10 wholesale store units for fruit and vegetable operators would be located in 1 building. Each unit would be 25 feet wide, center to center of dividing partitions, and 100 feet deep, including front and rear platforms 15 feet wide, with ceiling heights of not less than 20 feet at the lowest point. Platforms would be continuous and would be covered, with sufficient overhang to protect loading and unloading operations from inclement weather. Desirable overhangs on platforms have been found to be about 6 feet, but depend upon the heights of the platform and overhang.

Both platform areas should be continuous. Posts required for platform roof support should be placed so that they will interfere as little as possible with handling operations.

Platforms should be about 45 inches above the level of the street and protected along the edges by bumpers to prevent damage from trucks. Steps to the platform from the street should be placed at convenient intervals. Platform floors should slope slightly to the outside.

Doors to the enclosed part of the facilities should be 8 feet wide, of the overhead type in front, and 6 feet wide, of the double-acting type in the rear.

Wholesale operators may wish to obtain more than one store unit for their operations, so removable partitions between units should be used. Some operators would not need an entire unit, and thus require a unit to be split into two sections 50 feet deep and 25 feet wide, with one 15-foot platform. Separating partitions should be constructed so as to prevent seepage between units.

All fruit and vegetable units contain mezzanine offices 15 feet deep by 25 feet wide. These mezzanines are at the rear of the store and can be used as offices, or for light storage. To allow adequate room underneath the mezzanine areas for handling

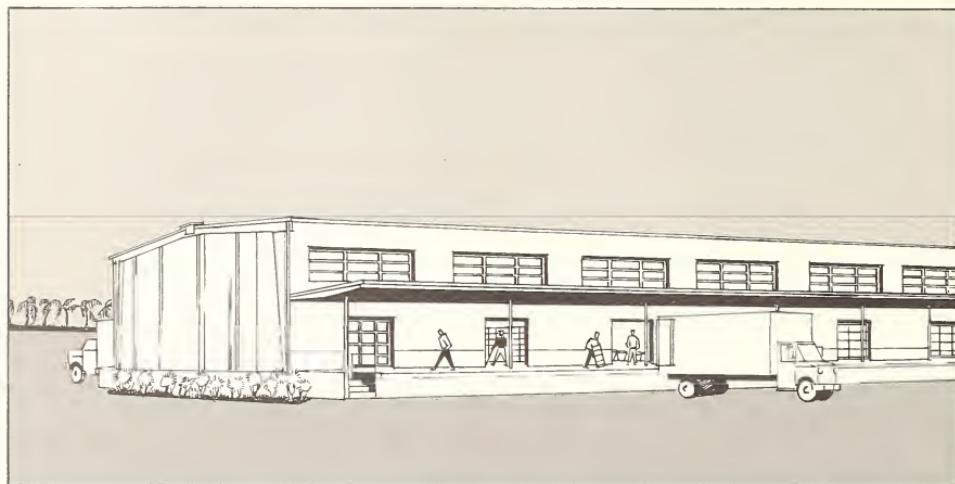


FIGURE 10.—Design for a multiple-occupancy building for handling wholesale food, San Juan, P.R., 1962.

operations, an overall ceiling height of at least 20 feet is necessary.

Adequate circulation of air is necessary to prevent hot or stagnant air from accumulating in the ceiling areas and to prevent excessive moisture from collecting. Interiors of the stores should be well lighted. To provide flexibility in lighting the stores, the system should be controlled by more than one switch so that only that portion being used need be lighted.

Floors should be designed to carry a live load of 350 pounds per square foot. They should be of reinforced concrete construction and adequately sloped and drained to prevent water from accumulating on them.

Air conditioning, refrigeration, and any interior design features would be added at the expense of the tenants. Interiors would be finished in an acceptable manner and would include restrooms, painted walls, and finished office space.

The building should be constructed of prestressed and preformed steel with adequate accessories such as roof insulation, ventilators, windows, and air conditioner blocks in the mezzanine areas.

A number of steel buildings are available that would provide the necessary features required for fruit and vegetable operators. Color harmony for the area should be maintained by selecting the proper colors at the time the specifications are developed. The overall plan should incorporate a design that will withstand a 35-pound or greater wind load. Base walls on each platform should

include a prestressed concrete wall 3 feet above the platform to protect the steel building from excessive puncture and defacing by handling equipment.

Each of the multiple-occupancy units in the fruit and vegetable building would include a total of 2,875 square feet of space, including wall areas. The first floor would contain 1,750 square feet of enclosed space and 750 square feet of platform space. The mezzanine would contain 375 square feet of space. The 10 units in the building would contain 28,750 square feet of space. Figure 11 shows a layout of a multiple-occupancy unit for a fruit and vegetable wholesale operator or for a handler of groceries and other products.

Multiple-Occupancy Units for Groceries and Other Products

In the proposed plan, the 52 wholesale units for handlers of groceries and other products would be located in 4 buildings. Each unit would be identical to those discussed in the previous section on fruits and vegetables.

Multiple-Occupancy Units for Meat and Meat Products

In the proposed plan, the 10 wholesale units for handlers of meat and meat products would be located in 1 building. Each unit would be 25 feet wide center to center of dividing partitions and 100 feet deep, with front and rear platforms 15

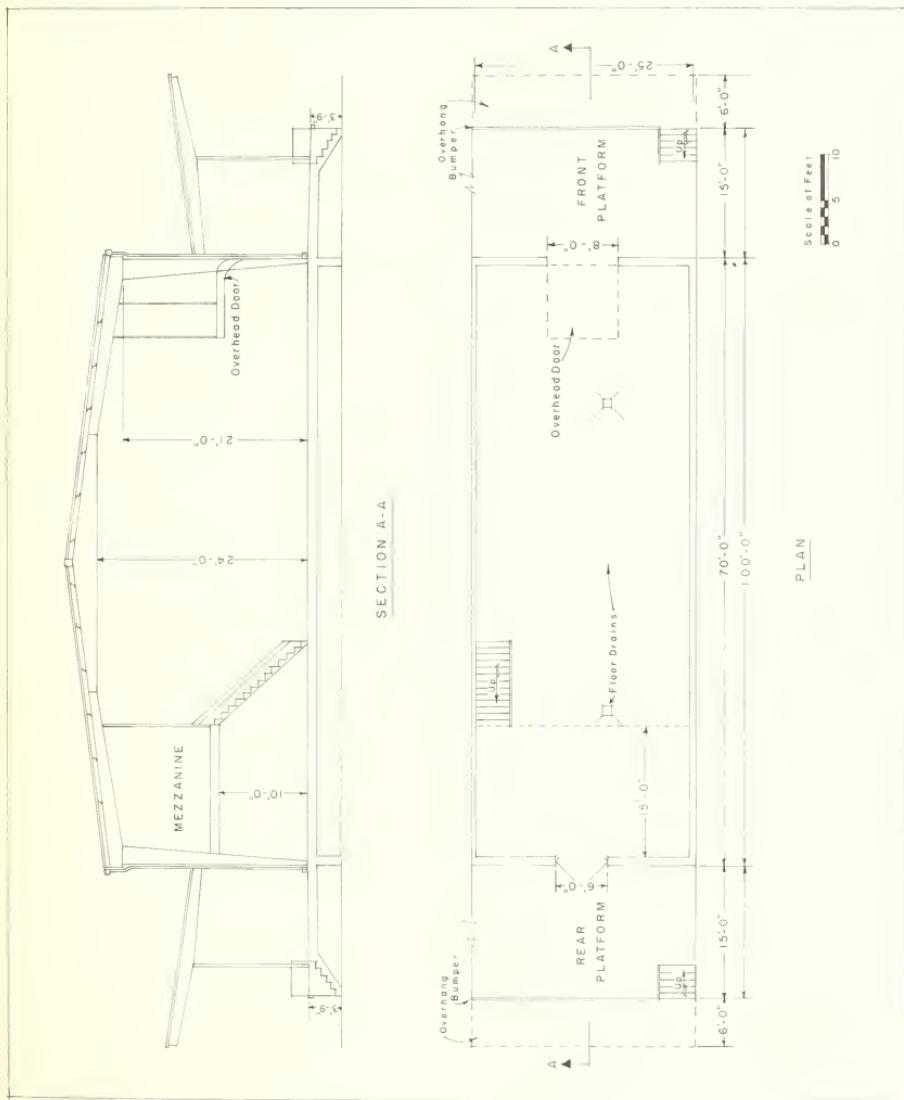


FIGURE 11.—Possible layout for a 25-foot unit in the proposed market for handling fruits and vegetables and groceries and other products in San Juan, P.R.

feet wide and with ceilings not less than 12 feet on the first floor and 8 feet on the second floor at the lowest point.

Platforms and other features would be similar to those proposed in the buildings for the other commodities except for rail systems for handling meat which would be supported from the roof.

Doors to the outside should be a refrigerated type with double-acting doors just inside to permit easy entry and exit. The entire first floor area, including the floors, should be insulated to temperatures of 32°-34° F. Refrigeration equipment and meat rails should be supplied by the tenants. Provision for the location of the refrigeration equipment is on the second floor. Units should be equipped with a hot water system capable of supplying water at 180° F. for cleanup purposes.

All units for meat operators would contain two complete floors. The first floor should be designed to carry a live load of 350 pounds per square foot. Second floors should be capable of carrying 300 pounds per square foot. Corridors serving the second floor should have exterior accesses. The floors should be reinforced concrete, with the first floor adequately sloped and drained. One drainage outlet should be available for each 400 square feet of first-floor space.

Individual wholesalers could occupy more than one unit for their operations; therefore, insulated, removable partitions should be used. Since some operators would not require a full unit, a unit could be split in half, creating 2 units 25 feet wide and 50 feet deep, with a single 15-foot platform. Walls should be waterproof.

Adequate circulation of air is necessary, and outlets should be provided in order to ventilate properly. Lighting and ventilation should be adequate for meat handling operations.

Air conditioning, refrigeration, office furnishings, meat rails, if required, and other interior features would be furnished by the tenants. Interior walls, office areas, and restrooms on the second floor would be painted or otherwise finished in an acceptable manner.

The buildings should be constructed of pre-stressed and preformed steel with adequate accessories such as roof insulation, ventilators, and air conditioner blocks in the second floor office areas. The end of the building opposite to the stairways should contain stairwell blocks that could be opened later, if the need for a second stairway developed.

Buildings should be constructed so that the second floor could be removed if it ever became desirable to have a 20-foot high ceiling. All floor areas should be waterproof and should be maintained as free of obstruction as possible for efficient operation.

Each of the multiple-occupancy units in the meat and meat products building would have a total of 4,250 square feet of space, including wall areas. The first floor would contain 1,750 square feet of enclosed space and 750 square feet of platform space. The second floor would contain 1,750 square feet of floor space which could be office, storage areas, or offices for firms not desiring first floor space, or a combination of these. The 10 units would contain a total of 42,500 square feet of space. Figure 12 shows a possible layout of a proposed meat and meat products unit in a multiple-occupancy building.

Limited-Purpose Buildings

Two buildings, each 340 feet wide and 460 feet long, with 156,400 square feet of first-floor area each, have been constructed on the site (fig. 13). Occupancy of these buildings is almost complete. Each building has approximately 24,000 square feet of office space on a mezzanine. These buildings, with floors at truck-bed level, are designed ultimately for large-volume grocery operations such as might be conducted by the chains operating in Puerto Rico. Reasonable growth of the chains is expected, and each of these buildings should be occupied by not more than four firms. When these buildings are completely occupied, it is expected that 12 firms, with a total need for about 312,800 square feet of first-floor space will occupy them. They could later be converted to more limited use at little cost. These buildings have floors and platforms 45 inches above the street at both the front and rear. Design of these buildings is of prefabricated steel with maximum span roofs about 20 feet clear.

Any adaptations in these buildings should be made at the expense of the tenant and should be such that they could be removed and placed in other buildings if necessary.

Restaurants, Bank, Public Restrooms, and Additional Offices

It is difficult for markets to function properly if certain service facilities are not included in the overall development. These include restaurants, banks, public restrooms, and additional office space. Other facilities, such as cooperage firms, motels, and truck servicing areas can be incorporated into the overall plan, but seem to fit better on the periphery of the area. Garbage firms operate more effectively close by, rather than within, the market. Such firms usually service a wider area than just the market.

In the proposed market, a restaurant, bank, public restrooms, and additional office space are provided.

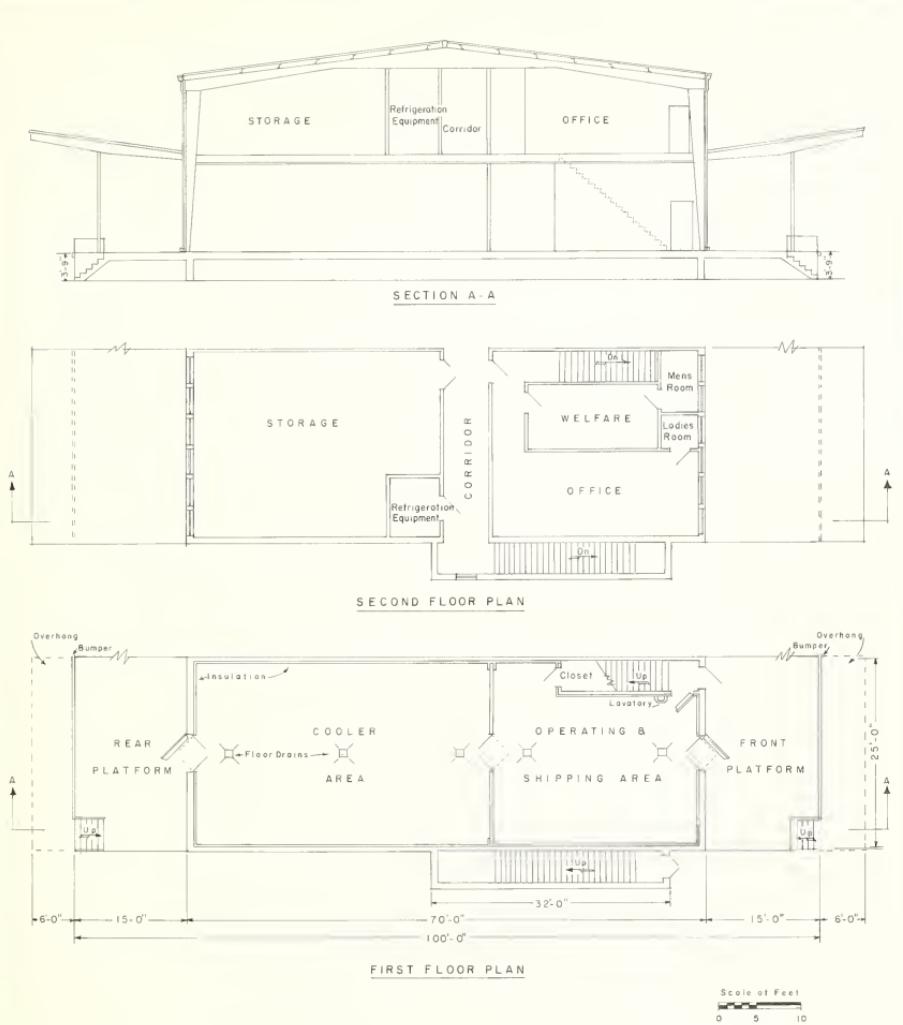


FIGURE 12.—Possible layout for a 25-foot unit in the proposed market for handling meat and meat products in San Juan, P.R.



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FIGURE 13.—Platform areas of limited-purpose structures which have been completed.

Restaurant

Space is provided for a restaurant in one of the multiple-occupancy buildings proposed for handling groceries. It should be placed at the end of a centrally located building. The space equivalent to one standard unit is proposed. This unit should have two complete floors, with only the first floor being devoted to a restaurant, although the second floor could be used for a restaurant if necessary. A restaurant that would attract tourists or downtown business men and families would require both floors, but if it is to service only market operators and employees, one floor probably would be adequate. In addition, the second floor could then be put to a more advantageous use. If elaborate restaurant facilities are developed, they probably should be located adjacent to the market property, to take advantage of the close association with the market, an excellent source of high quality foods. Such restaurants in United States cities have proved successful. It is proposed therefore, that one floor of a standard unit in one of the multiple-occupancy grocery buildings be devoted to a restaurant for market operators and employees and that additional facilities for a high class restaurant be developed by private interests adjacent or nearby.

Bank

Facilities for a banking institution to open either a branch office or complete banking services

are proposed for one standard unit in one end of the multiple-occupancy buildings devoted to grocery and grocery products. This facility should have office space on a mezzanine. The ground floor could be devoted to public bank services and the mezzanine to bank offices. The bank should be located directly across the street from the restaurant.

Public Restrooms

The need for public restrooms has been demonstrated in the newer wholesale markets that have been constructed. It is proposed that these facilities be placed on the second floor of the unit proposed for a restaurant, with outside entrances and exits. Facilities should be provided mainly for men, but some should also be set aside for women. If it is more desirable for these facilities to be located on the first level and the restaurant on the second floor, this decision should be made early by the firm designing and constructing the market.

Additional Office Space

Meat operators will not need all of the second-floor space in the multiple-occupancy building. This space should be used to provide office space for brokers, trucking firms, sales agencies serving the food industry, and others that require office space. Most meat operators will require about half of the space on the second floor of the units that they will occupy. A few will require some

storage space. Operators who will not use all of their second-floor space should be grouped together so that extra office space would be available in one area.

Leasing arrangements should be such that the operator on the first floor maintains control of the second-floor area above his meat and meat products operation. Any tenants of offices on the second floor should sublease from the original lease holder and be responsible directly to the operator. In units where two small operators do business on the first floor, offices for two firms requiring only office space might utilize the second-floor areas. This would result in as many as four firms operating in one standard unit, but only one should maintain the primary lease.

Adequate Streets and Parking Areas

If operating costs are to be minimized, adequate streets and parking areas must be provided. Adequate parking areas were not provided in the design of the two large limited-purpose buildings. Because of this, additional parking space has been provided for these buildings.

All major streets of the proposed market area should be wide enough for anticipated as well as present use. They should be paved to carry heavy traffic and designed to promote adequate drainage. Some parking areas should be designed for parking trucks only, others for automobiles and station wagons only, and other areas for trucks, automobiles, and station wagons. All parking at the platforms of buildings should be at 90-degree angles.

When buildings face each other, streets should be at least 200 feet wide to provide adequate driving space when trailer trucks are parked on each side. Other streets should be at least 50 feet wide, and wider where angle parking is permitted. On some streets, it might be necessary to allow parking, and on others, only sufficient space for traffic movement would be necessary. Parking areas should be convenient to the buildings, but should not block the streets or loading and unloading areas.

Land for expansion should not be depended upon for parking. Parking areas should be as definite a part of the market as buildings. Traffic and parking problems can be alleviated only by building streets of the proper width, and by providing sufficient parking. Buildings, under ideal conditions, should not occupy more than 25 percent of the total land devoted to the food distribution center. If buildings occupy a higher percentage, it is almost impossible to correct one of the major defects of the marketing facilities—one that must be corrected if the maximum in efficiency is to be obtained by the improvement program.

The number of employees, buyers, and daily loads and unloads in the market indicate that parking space for 600 cars and station wagons and 100 trucks would be needed. This is in addition to the tailboard space at the platforms for loading and unloading.

Expansion Area

Adequate land should be acquired for expansion of the facilities. In cities where new facilities have been constructed, operators not included in the preliminary plans have gravitated to the new market, and original operators have needed more space. The plan suggested here includes about 10 acres, or 20 percent of the total area, for later expansion.

There are additional areas available adjacent to the proposed site which could be designated for future development of single- or multiple-occupancy buildings.

In addition, after a maximum of about 5 years of operation, the temporary truck terminal will be available for use by wholesalers. It is expected that by this time there will be sufficient demand for space in the area and no trouble should be encountered in obtaining continuous occupancy in this facility after it is made available for wholesalers' use. Renovation will be required. This area is included in the acreage estimates and estimates for expansion.

Auxiliary Facilities and Considerations

A number of allied industries, such as handlers of coffee and beverages, cartage firms, general warehousing, and other industries associated with the food industries, would be provided for in the immediate vicinity of the market. Definite areas should be set aside for development by firms of this nature. A retail market might be a desirable addition, especially if it is located near the entrance to the area. An area also might be set aside for farmers' and truckers' operations. These facilities mentioned are for consideration at a later period, as the central market should be functioning before most of these firms and businesses would want to relocate.

Space has been set aside for a refrigerated warehouse in the area proposed. It should become operational at about the time the food wholesalers relocate in the area proposed. Because no specific tenant was considered available, nor were space requirements determined for a public refrigerated warehouse, only a proposed area is designated for this facility. An area is proposed because of the apparent shortage of economical and efficient refrigerated space. Specific studies should be made in the immediate future to determine the amounts

needed, tenancy, and feasibility of establishing a modern refrigerated warehouse in the area proposed.

Cooling facilities for preparing fresh products for export should also be considered at the same time as consideration is given for the establishment of a public refrigerated warehouse. This facility could be operated in connection with the warehouse. Oftentimes products are presented for shipment in the export market at field temperature. Equipment used in transport is not designed to reduce the temperature of the products in transit, but merely to maintain it en route. The export business in fresh products, such as fruits and vegetables, is in its infancy at the present time. As it grows—and there is every reason to expect it to if quality products are shipped—facilities for preparing, packaging, and processing for shipment will be required. Part of the temporary truck terminal currently in use on the site could

be used for this. However, because of the need for refrigeration, a separate facility is suggested in the plans.

No estimates of costs of buildings or land will be included for the auxiliary facilities in this report, as these should be constructed only after thorough study and planning.

Arrangements of Facilities in a Food Distribution Center

The arrangement of the facilities depends upon a number of factors. Among the more important ones are the shape of the site, physical features, location of access streets, number, kinds, and types of facilities required, amount of expansion expected, percentage of operators expected to relocate in the market, and types and kinds of vehicles used in transporting products to and from the area.

SITE SELECTION FOR WHOLESALE FOOD DISTRIBUTION CENTER

During the earlier study by the U.S. Department of Agriculture, the available sites were investigated and the area adjoining San Juan Bay southwest of Martin Peña Channel was selected. The site at that time was largely unimproved and not in condition for building. Vast areas of this site have now been prepared and several parts of it have permanent construction completed or underway. In other areas land consolidation has progressed enough for construction to be initiated.

During the course of this study, several other sites were investigated, as significant changes in transportation had taken place since the earlier study, and the volume and types of products had also changed. The site previously selected and commonly referred to as Puerto Nuevo, was again considered, along with a site known as the Gulf site, which was almost due west of the Puerto Nuevo site. The Gulf site is about 10 miles southwest of the city. After consideration and discussion with various agencies of the Commonwealth government and the city of San Juan, a site adjoining the power plant in the Puerto Nuevo area of the city was selected. Figure 14 shows the location of the area, with respect to Martin Peña Channel, and the major highways and access streets serving the area.

In the entire general site, there are about 800 acres that lie between Highway No. 2, San Juan Bay, Martin Peña Channel, and Highway No. 24.

For the facilities proposed, a site of at least 66 acres would be needed for buildings, expansion, parking, and streets. Additional acreage is available for allied industries. The 66 acres include 8.5 acres devoted to the temporary truck terminal facilities, 9.5 acres devoted to an area for a pub-

lic refrigerated warehouse, and 48 acres needed for the facilities of the 3 commodity groups. The 18 acres required for the public refrigerated warehouse and the temporary truck terminal are excluded from further consideration, but figure 15 shows these areas and their relationship to the general area.

Numerous alternative layouts could be proposed, but it is believed that the layout in figure 15 presents a plan that makes maximum use of the area for both the short and the long run.

Factors Considered in Selecting a Site

The site at Puerto Nuevo was selected because it is the most favorable in the entire metropolitan area. In addition, the various governmental agencies of the Commonwealth and of San Juan have been planning for a central market development for the area as a result of the U.S. Department of Agriculture's earlier report. There is common agreement by all agencies concerned that this not only is the most economically feasible site, but one of the most acceptable from the standpoint of the general public.

In arriving at the conclusion that this site remains the most desirable the following economic factors were considered: (1) Convenience to port facilities, (2) convenience to buyers, retail outlets, and producers, (3) convenience to motor transport and avoidance of nonmarket traffic, (4) accessibility of public utilities, including transportation, (5) availability of labor, (6) population growth, (7) availability of land at reasonable cost, and (8) land use, topography, shape of tract,

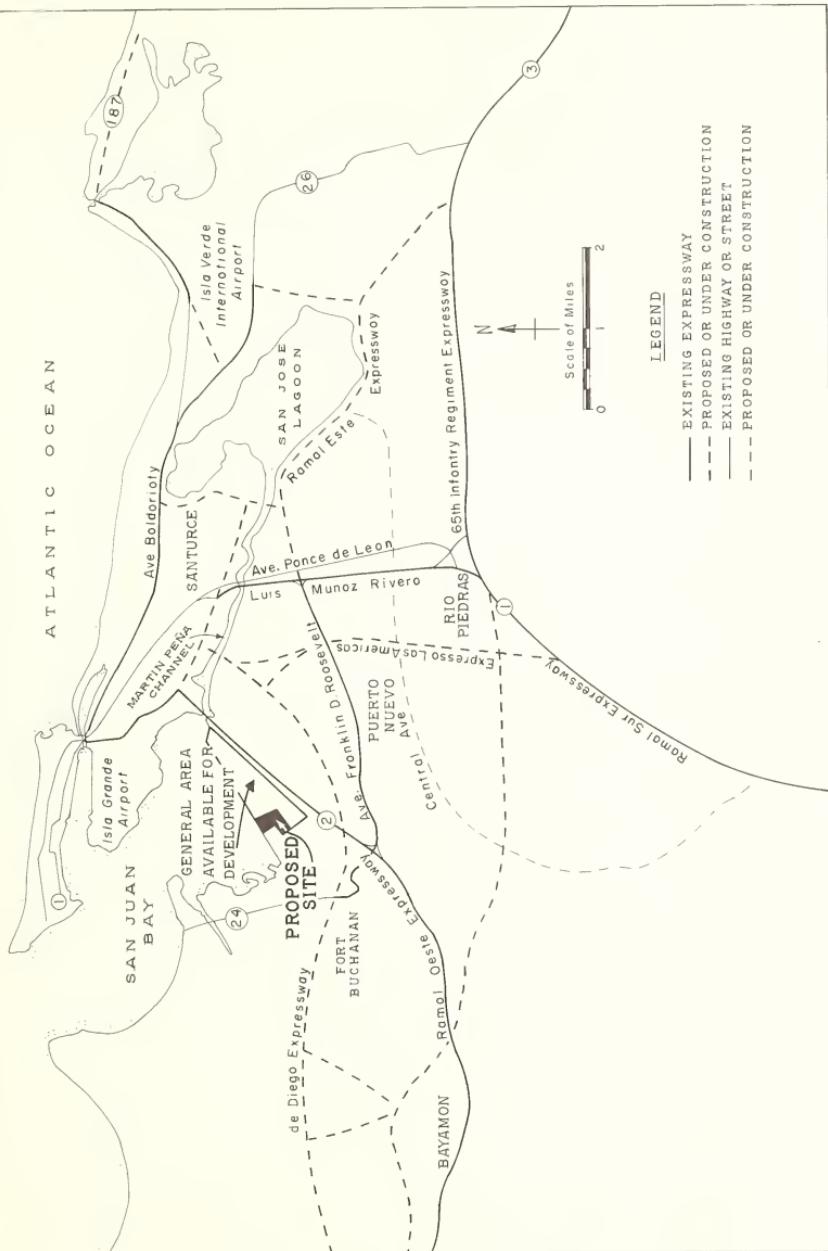


FIGURE 14.—Location and the major streets serving the Puerto Nuevo site in San Juan, P.R.

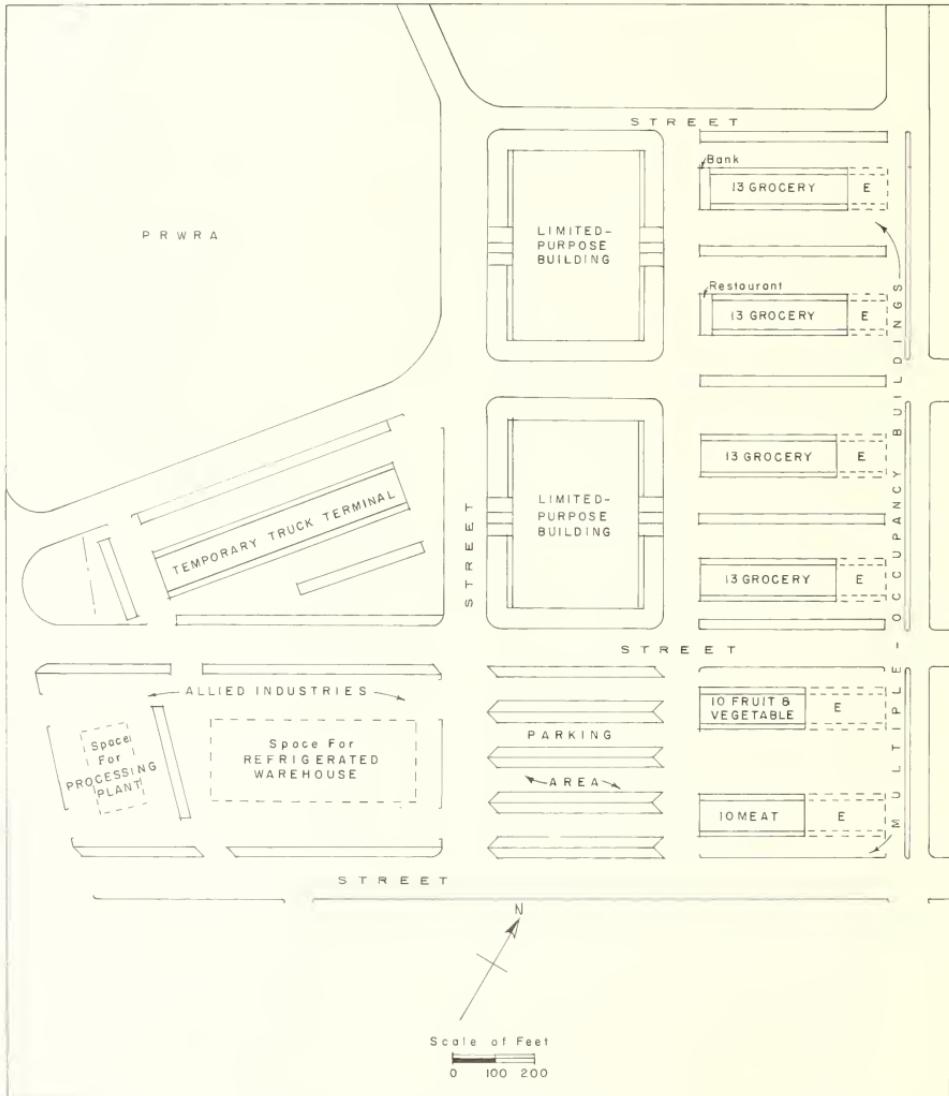


FIGURE 15.—Layout of the proposed facilities on the Puerto Nuevo site, San Juan, P.R.

and zoning. It would be impossible to obtain an area that would satisfy all of these requirements perfectly, but the site in Puerto Nuevo is the best compromise available.

Convenience to Port Facilities

Formerly, a dockside location was of utmost importance if handling and cartage costs on imported foods were to be minimized. But with the rapid conversion to containerized shipping, the importance of this location has diminished significantly. To avoid long hauls through the metropolitan area with the containers, however, it is still desirable to be located as near the receiving point as possible. The proposed market is in the immediate vicinity of the docks of the major carrier, the breaking and handling area proposed for this carrier, and the facilities proposed for the competing carriers. Minimum delays would be experienced in receiving products in the market from all carriers serving San Juan. Over 85 percent of the direct market receipts are imported.

Convenience to Buyers, Retail Outlets, and Producers

With the completion of the system of limited-access highways in and around San Juan and to other points in Puerto Rico, the Puerto Nuevo area will be one of the most accessible points in the entire metropolitan area. Of the total product handled, 46 percent goes to points outside the city, 50 percent is distributed in the city, and about 4 percent is exported.

In the proposed market, buyers could visit the market area, obtain the products required, and return with a minimum of delay.

The approximate geographical center of the Metropolitan San Juan retail outlets has shifted slightly to the east since 1949 if it has followed the shifts in population. The center of population shifted east about 1 mile and about one-fourth of a mile north. But the shift is not enough to justify any radical changes in location of the market.

Convenience to Motor Transport

Because over 95 percent of the products shipped from the market and about 10 percent of that arriving in the market is moved by motor vehicles, it is imperative that adequate highways be available to all groups using the market. When the present highway system has been completed, few areas on the island will be serviced as well as San Juan.

It is also important that no through streets traverse the market area. This prevents unneces-

sary traffic and congestion in the market and deters occupants of other facilities from competing for parking space. There are through streets close by.

Availability of Land at Reasonable Cost

Sufficient land at reasonable cost is desirable. It is imperative for sufficient acreage to be available for both present and future needs of the market. Expansion areas are just as important as the areas designated presently for parking, buildings, and streets.

The cost of land and the costs of placing it in condition to build have a direct bearing upon the amount of income required to amortize the investment costs. Costs of land should not be the controlling factor because these costs might be more than offset by the savings in transportation costs when the market is moved closer to the center of distribution. The costs of land are experienced only once, whereas transportation of products to and from the market area is a daily and recurring cost. A sacrifice in convenience of location would be advisable only if the price of land would cause the rental charges to be so high as to more than offset advantages in operation costs. The site selected in Puerto Nuevo is not so priced, and the location is desirable and the amount of land available is adequate. A site of about 66 acres, which is available, is considered adequate for present operations and future expansion.

Land Use, Topography, Shape of Tract, and Zoning

The Puerto Nuevo area is largely open filled land with only limited structures on the periphery. No buildings requiring demolition are on the site. Two large limited-purpose structures have been built. The temporary truck terminal will become an integral part of the proposed food distribution center once it is vacated by the present occupant.

The tract is level, one of the few such in the area of sufficient size to accommodate the proposed development. Filling and land consolidation have been accomplished on large areas within the total site.

Land use in the layout is quite satisfactory, as the ratio of 1 square foot of building to each 4 square feet of ground area is maintained. The area proposed is rectangular, about twice as long as it is wide. In addition to this area, and adjoining it, is a tract of about 18 acres on which the temporary truck terminal is located, and for which a cold storage warehouse and a processing plant are proposed.

Zoning in the area is acceptable and no changes in the ordinances would be required. The property is presently owned by the local government and is under consideration for development by the Ports Authority.

A food distribution center would not diminish values or create a nuisance in the area. The surrounding property would not detract from the value of the market proposed for the site.

Accessibility of Utilities

Accessibility of public utilities such as water, gas, electricity, and sewage disposal is a necessity. The proposed area is adequately served with the necessary utilities. In addition, public transportation for employees is available near the site.

ESTIMATED INVESTMENT COST

Estimated investment costs for a wholesale food distribution center at the proposed location involve two primary components—land and facilities. Costs that will be shown in this section are for March 1964.

Land

The cost of land in condition to build is calculated on the basis of the amount required for the area occupied by the two multiple-purpose buildings, the six multiple-occupancy buildings, and the associated parking areas. Land costs for the temporary truck terminal on the west side of the site and the area proposed for the construction of a refrigerated warehouse are not included; these areas contain about 18 acres. The remaining 48 acres of the proposed 66-acre site are included. Total cost of the 48 acres of land at \$160,000 per acre is \$7,680,000. For purposes of this report, it is proposed that the market obtain the real property and construct the necessary facilities. A lease arrangement could also be used.

The land costs include the total costs of the land, costs of filling and consolidation, holding the land during the filling and land consolidation time, and other preparation required to place the site in condition to build. The site in condition to build means that the necessary utilities have been brought to the site and includes installation of both storm and sanitary sewers.

In the breakdown of costs of each segment of the market, the land costs are included for the specific acreage required.

Facilities

Costs of facilities are estimated on the basis of construction indexes for March 1964 and of costs of constructing similar facilities in other areas,

Availability of Labor

Sufficient labor would be available at the proposed site, as most of the present employees could commute quite easily to the proposed area. Many would find getting to and from work much quicker than with present facilities.

Population Growth

Growth in population has occurred and, as discussed earlier, has shifted slightly. The shifts have not been excessive, and the changes are not of a magnitude to justify any change in the location of the wholesale food handling facilities from the area proposed in the 1950 study. Growth, as in most cities, has been greatest in the suburbs.

estimates of local engineering firms, and estimated costs of constructing similar facilities in the San Juan area. Cost estimates are for structures previously described.

The multiple-occupancy units and other buildings proposed do not have furnished offices, but the estimates include stairways, toilet facilities, lighting fixtures, electrical outlets, and platform lighting.

The first floor of the multiple-occupancy unit for meat and meat products would be insulated. No equipment for refrigeration or meat rail systems would be provided. All outside doorways would be equipped with standard cooler and double-acting doors.

Exposed roof areas would be insulated in all buildings. Multiple-occupancy units for grocery and grocery products and for fruits and vegetables would be equipped similar to the meat units, except mezzanines are proposed rather than a full second floor, no insulation, except for roof areas, would be provided, and door arrangements are somewhat different.

Detailed building costs are presented for the shell building, the second floor or mezzanines, and any special features required by a specific group. Information is presented by commodity groups so that any portion or special features of any facility may be omitted without impairing the remainder of the estimates presented. Costs presented for the two limited-purpose buildings are those provided by Lorenzo A. Cruz and Associates in their discussion of the consumer's savings at the central market area of Puerto Rico in October 1962. Cost estimates are based upon prefabricated steel buildings with reinforced concrete floors, platform areas, and concrete protective walls 3 feet high on all platforms.

Estimates for paved surfaces, other than reinforced concrete aprons in front of each platform, include market streets and other parking areas within the market area. Paving costs assume a 7-inch gravel foundation, a 4-inch macadam base, and a 2-inch asphaltic concrete surface.

Space proposed for the initial facilities depends upon both present and anticipated needs. Actual space needed may differ from the estimates slightly, depending upon the time of completion of final plans for construction.

All the utility connections are on the site. Other construction costs include architects' fees at 6 percent, construction loan at 3 percent, and a contingency fund at 5 percent. These are included as part of the construction cost for the type of construction proposed. Construction loans are available on the type of construction proposed for 3 percent because of the short construction period required to erect the structures. Normally, construction loans run about 5 percent, but usually involve much longer periods of time. The contingency rate is lower because of the fixed nature of the tax rate and base. The costs of the construction loan represent the total cost of the loan and are not considered an interest rate.

Construction costs shown in this section should be used only as a guide in estimating the total cost of the market. They are not intended to replace firm estimates made by local architects and contractors at the time of construction.

The following tabulation shows the estimated costs of facilities for the three product groups as of March 1964 at the Puerto Nuevo site:

Fruits and Vegetables

Multiple-occupancy building:

10 multiple-occupancy store units (2,500 square feet of 1st floor space, including platforms, and 375 square feet of mezzanine office space) in one building at \$14,001 per unit, or \$4.87 per square foot	\$140,010
2 floodlights at \$150 each	300
Costs of buildings for fruits and vegetables	140,310

Other facilities:

Paving—concrete aprons 40 by 250 feet at each platform at \$4.40 per square yard and 9,800 square yards of asphaltic concrete paving at \$3.70 per square yard	46,037
Utility distribution system (gas, electricity, and water) at 10 percent of building costs	14,031
Cost of other construction for fruits and vegetables	60,068
Total costs of building and other construction for fruits and vegetables	200,378

Other costs:	
Architect's fee—6 percent of construction costs	12,023
Costs of construction including architect's fee	212,401
Construction loan—3 percent of construction costs and architect's fee	6,372
Costs of construction, architect's fee and construction loan	218,773
Contingency—5 percent of costs of construction, architect's fee, and construction loan	10,939
Total costs of building, other facilities, and other costs	229,712
Land:	
Costs of 3.5 acres of land in condition to build	560,000
Total costs of fruits and vegetables facilities	789,712
<i>Meat and Meat Products</i>	
Multiple-occupancy building:	
10 multiple-occupancy store units (2,500 square feet of 1st floor space, including platforms, and 1,750 square feet of 2d floor space) in one building at \$20,698 per unit, or \$4.87 per square foot	\$206,980
Insulation, 48,000 square feet, 4-inch base at \$2.25 per square foot applied	109,350
2 floodlights at \$150 each	300
Costs of building for meat and meat products	316,630
Other facilities:	
Paving—concrete aprons 40 by 250 feet at each platform at \$4.40 per square yard and 9,800 square yards of asphaltic concrete paving at \$3.70 per square yard	46,037
Utility distribution system (gas, electricity, and water) at 10 percent of building costs	31,663
Cost of other construction for meat and meat products	77,700
Total costs of building and other construction for meat and meat products	394,330
Other costs:	
Architect's fee—6 percent of construction costs	23,660
Costs of construction including architect's fee	417,990
Construction loan—3 percent of construction costs and architect's fee	12,540
Costs of construction, architect's fee, and construction loan	430,530
Contingency—5 percent of costs of construction, architect's fee, and construction loan	21,527
Total cost of building, other facilities, and other costs	452,057
Land:	
Costs of 3.5 acres of land in condition to build	560,000
Total costs of meat and meat products facilities	1,012,057

Groceries and Other Products

Multiple-occupancy buildings:

52 multiple-occupancy store units (2,500 square feet of 1st floor space and 375 square feet of mezzanine office space) in 4 buildings at \$14,001 per unit, or \$4.87 per square foot-----

2 limited-purpose buildings, 156,400 square feet of 1st floor space each with mezzanine office areas of 24,000 square feet at \$4.17 per square foot-----

2 multiple-occupancy units in 2 grocery buildings, 1 of which would be used for a restaurant and 1 for a bank. (Restaurant unit to have public restrooms on 2d floor; bank to have mezzanine office.) 1 at \$20,698 per unit with 2d floor, or \$4.87 per square foot, and 1 at \$14,001 per unit with mezzanine office, or \$4.87 per square foot, including \$2,500 additional construction for restaurant, \$3,000 additional construction for restrooms, and \$5,000 additional construction for bank-----

8 floodlights at \$150 each-----

Costs of buildings for groceries and other products, bank, restaurant, and public restrooms-----

Other facilities:

Paving—concrete aprons, four 325 by 40 feet and four 350 by 40 feet at \$4.40 per square yard and 137,855 square yards of asphaltic concrete paving \$3.70 per square yard-----

Utility distribution system (gas, electricity, and water) at 10 percent of building cost-----

TABLE 11.—*Summary of the estimated costs of land and construction for the proposed wholesale food distribution center at the Puerto Nuevo site, San Juan, P.R., 1964*

Type of operator	Land required	Costs		
		Land	Facilities	Total
Fruits and vegetables-----	Acres 3. 5	Dollars 560, 000	Dollars 229, 712	Dollars 789, 712
Meat and meat products-----	3. 5	560, 000	452, 057	1, 012, 057
Groceries and other products ¹ -----	² 41. 0	6, 560, 000	3, 517, 647	10, 077, 647
Total-----	³ 48. 0	7, 680, 000	4, 199, 416	11, 879, 416

¹ Includes proposed areas for restaurant, bank, and public restrooms.

² Includes about 7 acres of parking for the limited-purpose buildings.

³ Includes 10 acres for expansion.

METHODS OF FINANCING AND OPERATION

The success of a new central market for food products in San Juan depends, to a large extent, upon the type of ownership and management, regardless of how well the market may have been designed and built.

A large complex of interests and groups are concerned with the type of management. Producers, processors, transportation companies, market operators, retailers, and consumers have a direct interest in the management of the market.

Investors, insurance companies, and city and Commonwealth government officials are vitally concerned with its successful operation because of the investment and the public interest. The investors, whether private or public funds are used, have a right to expect a reasonable return and assurance that their interests will be protected. It is desirable, therefore, that the board of directors, or other management board, include representation from all the interested groups most concerned with the successful operation of the market.

When improved facilities are established, it is important that the ownership be prevented from exploiting the industry. Certain safeguards should be provided, because the market should function as a public service facility. As the market becomes established as a going concern, its income becomes dependable and reasonable, and returns to investors are being made, the reasons for precautions will become even more apparent.

Regardless of what agency constructs and finances the market, there should be definite assurance that (1) it will be properly located, designed, and equipped, (2) construction of excess facilities will be prevented, (3) funds will be invested wisely to provide for real needs, so that increased efficiency will not be offset by high rents, (4) the facilities will be used in the best interest of the industry and the public which it serves, and (5) it will be operated without discrimination against any buyer, seller, form of transportation, or origin of any shipment.

This report deals with the facilities for three classifications of food commodities and the estimated costs and revenue required are for these commodities only. No costs or revenue requirements are included for the temporary truck terminal or proposed refrigerated warehouse area. Certain economies would be associated with these facilities when they become functional.

The method selected to finance and operate the proposed market would materially affect the rents necessary to make the market self-sustaining. Many methods are available for financing such a project. Some of the forms are: (1) A private corporation, (2) a Commonwealth authority or corporation, and (3) a municipal authority or corporation. For purposes of identification throughout the remainder of this report, financing and operation by the Commonwealth government or a subsidiary and by the city of San Juan will be referred to as public financing. Because of the similarity of the two methods, only one will be discussed in detail.

Additional methods and combinations of different methods of financing and operation are possible. However, the above sufficiently represent the range of possibilities. Information on other methods is given in a 1957 Department report.¹¹

Financing and Operation by a Private Corporation

A private company could finance, construct, and operate a wholesale food distribution center on the Puerto Nuevo site. The principles of this method and several of the complications that would be encountered are similar to those of other methods. The revenue requirements for a privately developed central market will be considered under four categories: (1) Costs of management, (2) insurance, maintenance, and repairs, (3) taxes on real estate, and (4) debt service. These requirements will be considered for each method of financing and operation at the Puerto Nuevo site.

Costs of Management

The day-to-day operation of a wholesale food distribution center requires highly competent management. Certain other administrative costs inherent in successful operation must be included and are listed in the tabulation that follows. No allowances have been made for trash and garbage removal and street cleaning. Street cleaning should be done by the city of San Juan; garbage and trash removal might be the responsibility of the city or of individual tenants. Allowances are included for the general sanitation of public restrooms and other public areas.

The annual management expenses for the proposed wholesale food-distribution center are estimated as follows:

Manager	-----	\$10,000
Watchman, 2 at \$1,500	-----	9,000
Secretary-bookkeeper	-----	5,000
Auditing and legal assistance	-----	3,000
Office rental	-----	2,500
Advertising and promotion	-----	2,000
Office supplies and equipment	-----	1,500
Travel, telephone, telegraph	-----	2,000
Utilities; cleaning offices and public areas	-----	1,200
Contingency	-----	2,300
Total costs of management		38,500

Management costs are divided among the three commodity groups on the basis of construction costs, as follows:

Operators	Percent	Dollars
Fruits and vegetables	6.6	2,541
Meat and meat products	8.6	3,311
Groceries and other products	84.8	32,648
Total	100.0	38,500

¹¹ CLOWES, H. G., ELLIOTT, W. H., and CROW, W. C. WHOLESALE FOOD MARKET FACILITIES—TYPES OF OWNERSHIP AND METHODS OF FINANCING. U.S. Dept. Agr. Mktg. Res. Rpt. 160, 96 pp. April 1957.

Insurance, Maintenance, and Repairs

A private company would need to insure the buildings for fire and extended coverage and would also issue liability insurance. Rates used for fire and extended coverage on the type of structures proposed are \$1.15 per \$1,000. It was assumed that the structures would be insured for 80 percent of their value. Costs of liability insurance for any one occurrence based on a maximum of \$500,000 at \$1.75 per \$1,000 liability coverage is \$875 annually. Rates are not applied to, nor do they include, any property of tenants.

Maintenance and repairs were assumed to be 0.5 percent of the facility costs. This rate is being used because of the type of construction proposed, which is relatively trouble free and requires only nominal maintenance and repairs. The rate was applied to all buildings and facilities, but not to land.

To provide a reserve for increases in these costs, a contingency of 10 percent of the costs of insurance, maintenance, and repairs is included. A summary of annual costs of insurance, maintenance, and repairs appears in table 12.

Real Estate Taxes

The third major item of expense in the operation of the proposed market by a private corporation would be taxes on real property and improvements. The Commonwealth tax rate for fiscal year 1962 was \$1.03 per \$100 of assessed valuation. The specific municipal tax rate in Metropolitan San Juan depends upon the amount of municipal debt and the willingness of the municipal government to finance certain general expenditures from

the proceeds of this tax. Although there is no tax rate limit for debt purposes, the tax rate for general expenses cannot be greater than \$2.00 per \$100. The combined municipal and Commonwealth tax is, therefore, estimated on the basis of \$3.03 per \$100 assessed valuation, which is considered market value.

Because of the relatively fixed nature of the tax rate and assessments, a contingency fund of only 5 percent of the annual costs of taxes is included to provide for any increased rate or assessment. After a modest reserve has been accumulated, this might be discontinued.

The estimated amounts of taxes to be paid by a private corporation operating the market at Puerto Nuevo are given in table 13.

Debt Service

The fourth major segment of cost that must be paid by a private corporation owning and operating the proposed market is debt service. If the market is to be self-liquidating, the investment must be repaid from market revenue, and certain standards for payment must be maintained. Facilities of the type proposed should not become obsolete in less than 30 years, and likely would be useful for a much longer period. The facilities proposed are of durable construction and, with only minor alterations, could be expanded or converted to use by several types of occupants.

A private corporation financing, constructing, and operating the market might obtain its capital from three sources: (1) First mortgage, (2) second mortgage, and (3) equity capital. Because the money market fluctuates, various amounts at various rates might be obtained from each source.

TABLE 12.—*Estimated annual costs of insurance and maintenance and repairs for a wholesale food distribution center at the Puerto Nuevo site if operated and financed by a private corporation, San Juan, P.R., 1964*

Type of operator	Total investment	Annual costs				
		Insurance		Maintenance and repairs ³	Contingency ⁴	Total
		Fire and extended ¹	Liability ²			
Fruits and vegetables-----	Dollars 789,712	Dollars 211	Dollars 58	Dollars 3,949	Dollars 422	Dollars 4,640
Meat and meat products-----	1,012,057	416	75	5,060	555	6,106
Groceries and other products-----	10,077,647	3,236	742	50,388	5,437	59,803
Total-----	11,879,416	3,863	875	59,397	5,414	70,549

¹ Fire and extended coverage is based on 80 percent of the building costs at \$1.15 per \$1,000. Building costs for fruits and vegetables are \$229,716, meat and meat products, \$452,057, and for groceries and other products, \$3,174,484.

² Based on a limit of \$500,000 for each occurrence at

\$1.75 per \$1,000. Amount for each commodity is proportionate to the total investment.

³ Based on 0.5 percent of estimated building costs (footnote 1).

⁴ Based on 10 percent of the annual costs of insurance, maintenance, and repairs.

TABLE 13.—*Estimated annual costs of taxes for the proposed wholesale food distribution center at the Puerto Nuevo site if operated and financed by a private corporation, San Juan, P.R., 1964*

Type of operator	Assessed value ¹	Tax rate per \$1,000 ²	Annual costs		
			Taxes	Contingency ³	Total
Fruits and vegetables.....	Dollars 789,712	Dollars 3.03	Dollars 23,928	Dollars 1,196	Dollars 25,124
Meat and meat products.....	1,012,057	3.03	30,665	1,533	32,198
Groceries and other products.....	10,077,647	3.03	305,351	15,268	320,619
Total.....	11,879,416	3.03	359,944	17,997	377,941

¹ Total investment assumed to be tax base.² Combined rate of \$1.03 for Commonwealth and the maximum of \$2.00 for the municipal rate.³ Contingency based on 5 percent of the annual costs of taxes.

It is assumed that 65 percent might be obtained on a first mortgage and 25 percent on a second mortgage, and that the remaining 10 percent might be equity capital. Under various conditions at the time of financing, the percentages supplied by the various sources could change materially.

For purposes of this report, a cost rate of 6 percent, amortized over a 30-year period, was assumed. If a first mortgage could be obtained at 5.5 percent for 65 percent of the required investment, a second mortgage at 6.5 percent for 25 percent of the requirement, and the equity capital at 7 percent, an average interest rate of slightly less than 6 percent would result. The rates suggested are for purposes of estimating the revenue required to finance the proposed market under a private corporation. If the equity capital were supplied by the tenants in proportion to relative costs of the facility, there would probably be no payments of dividends to stockholders, because of the tax situation. Under this assumption, the private company would be acting as a cooperative and the 6-percent rate might be higher than the actual cost of obtaining the required capital.

If stocks or bonds were issued, purchasers might demand that annual income exceed annual expenses by some stipulated amount and that this amount remain as a reserve fund. The amount required would vary according to money market conditions, financial rating of the bond or stock issues, and the nature of the collateral offered. Collections for this reserve fund might amount to as much as 20 percent of the annual debt service costs. Such a fund might not be required to accumulate to an amount greater than 1 full year's amortization payment. After a full year's debt service payment has been accumulated, it might be possible to discontinue the allowance. In the following computations a 20-percent reserve allowance was included.

The exact terms of obtaining financing cannot be known until a financial plan has been completed. To estimate the amount of annual rental necessary, 6 percent interest has been used for a 30-year period. Table 14 shows the estimated annual income required for debt service to amortize the costs of the proposed central market in Puerto Nuevo.

TABLE 14.—*Estimated annual costs of debt service for the proposed wholesale food distribution center at the Puerto Nuevo site if operated and financed by a private corporation, San Juan, P.R., 1964*

Type of operator	Total investment	Annual costs		
		Payments ¹	Reserve or contingency ²	Total
Fruits and vegetables.....	Dollars 789,712	Dollars 57,372	Dollars 11,474	Dollars 68,846
Meat and meat products.....	1,012,057	73,526	14,705	88,231
Groceries and other products.....	10,077,647	732,141	146,428	878,569
Total.....	11,879,416	863,039	172,607	1,035,646

¹ Including principal and interest. Calculated on the basis of 6 percent over 30 years, or an annual cost of \$72.65 per \$1,000.² Based on a rate of 20 percent of the annual payments for debt service.

Total Annual Revenue Required by a Private Corporation

For a private corporation to finance and operate the proposed wholesale food distribution facilities at Puerto Nuevo annual revenue must cover the costs of management, real estate taxes, insurance, maintenance and repairs, and debt service. Total estimated annual revenue required is \$1,522,635, if all of the above items are to be paid or amortized over a 30-year period. Table 15 gives a summary of the estimated costs of operation if the market is operated and financed by a private corporation.

Financing and Operation by a Commonwealth or Municipal Authority

If the proposed wholesale food distribution facilities were financed under provisions applicable to other public projects in San Juan or available to the Commonwealth, certain cost advantages could be obtained. For purposes of this report, whether financing is backed by the city of San Juan or by the Commonwealth of Puerto Rico, the methods would be so similar that no separate treatment will be given; instead, all references will be to public financing and operation hereafter.

Public financing has many advantages and some disadvantages. The main advantages are: (1) Lower rates of interest on the bonds or loans for financing the required investment, (2) sufficient capital for future development as well as current needs can be obtained, (3) the market would function as a public service facility and achieve certain specific tax advantages, (4) all interests in the market could be fully represented, (5) ownership could not reasonably exploit the industry, (6) the facilities built would be used in the best interest of the public which it serves, and (7) increased efficiency would not be offset by unreasonably high rents and the market could function without discrimination against any buyer, seller, form of transportation, or origin of shipment.

There are also a considerable number of disadvantages, of which the most important are: (1) Operators are not acquiring title to the facilities or the property, (2) by using the credit reputation of the municipality or Commonwealth, the agency is providing a subsidy to this industry, and (3) lack of control by the wholesale operators using and renting the facilities.

Costs of Management

Costs of management, whether the market is financed and operated by a private corporation or by a public agency, will be about the same. The same responsibility for honest, efficient, and capable management exists in both cases. Costs of management are estimated at \$38,500 annually.

Insurance, Maintenance, and Repairs

Like the costs of management, the costs of insurance, maintenance, and repairs will be essentially the same under public ownership as under private ownership. The municipality or the Commonwealth could be self-insured and effect certain economies in the short run, but in the long run, it is doubtful if there are any real economies associated with this, and the convenience of carrying adequate fire, liability, and extended coverage insurance would more than offset any advantages in not providing it. For economy reasons, repair and maintenance of the facilities should not be neglected in either public or private operations. The estimated annual costs of insurance, maintenance, and repairs are about \$70,500 annually.

Real Estate Taxes

Under the provisions of the tax laws of Puerto Rico, land that is used for public purposes is exempt from real property taxes.¹² Under full public ownership no taxes would be paid. However, since all of Puerto Rico would benefit, pay-

¹² COMMONWEALTH OF PUERTO RICO, DEPT. OF THE TREASURY. WHAT YOU SHOULD KNOW ABOUT TAXES IN PUERTO RICO. 89 pp. 1964.

TABLE 15.—*Estimated total annual revenue, including reserves and contingency, necessary for a private corporation to finance and operate the proposed wholesale food distribution center at the Puerto Nuevo site, San Juan, P.R., 1964*

Type of operator	Management	Insurance, maintenance, and repairs	Taxes	Debt service	Total revenue required
Fruits and vegetables.....	Dollars 2,541	Dollars 4,640	Dollars 25,124	Dollars 63,846	Dollars 101,151
Meat and meat products.....	3,311	6,106	32,198	88,231	129,846
Groceries and other products.....	32,648	59,803	320,619	878,569	1,291,639
Total.....	38,500	70,549	377,941	1,035,646	1,522,636

ments in lieu of taxes probably would be made to the taxing authority. Annual payments would probably be established, and as the proposed market appreciated in value, the payments likely would increase. For a publicly owned and operated market, the Commonwealth government has suggested a tax rate to cover both buildings and land. The proposed rate of payments in lieu of taxes, based on a flat assessment for land and buildings, is \$6,000 per acre per year for the first 5 years, \$12,000 per acre per year for the next 10 years, and \$16,000 per acre per year for the next 15 years. These rates would yield an average annual payment of \$18,907 per year for 30 years. Payments in the early years would be substantially greater than the requirements during the early years, and as a result, only a limited contingency would be required. It is estimated that a contingency of 5 percent, or \$945 per year, would be sufficient to cover increases in the tax rate. The estimated average annual payments in lieu of taxes would be \$19,852 per year, or a small fraction of the \$377,941 required under private ownership.

The current properties occupied by the tenants, when redeveloped or rehabilitated, will increase considerably in value and, as a result, the above moderate rate is easily justifiable because the total tax base will increase substantially.

Debt Service

Public financing and operation of the proposed facilities for handling food in San Juan will permit considerable savings in the cost of operation. A saving in debt service costs of 20 percent per year will be realized by public financing and operation because a lower rate of interest could

be obtained. The bonds or other method of financing would probably be outside the legal debt limit of the municipality or Commonwealth, but borrowing would be backed by the credit of the agency concerned. As a result, the agency would have an interest in assuring that the market was operated as efficiently as possible. Of course, the exact terms of financing will depend upon several factors, such as the money market, credit ratings of the bonds, and the credit standing of the agency involved. It is impossible to determine the exact rate that would be required to obtain the necessary funds, but it is reasonable to assume a rate of approximately 4 percent annually. For this study, a debt reserve of 20 percent is included. After a full year's reserve is obtained, as under a private corporation, this might be discontinued. Table 16 shows the amount of revenue required for debt service if the market is publicly operated, including the necessary reserves.

Total Annual Revenue Required by Public Financing and Operation

The amount of revenue required for a public agency to finance and operate the proposed market at Puerto Nuevo is considerably less than for a private corporation. Management costs and costs of insurance, maintenance, and repairs would be about the same regardless of who finances and operates the market. Substantial savings could be realized in the costs of both taxes and debt service by public financing and operation. Table 17 shows the total amount of revenue required to finance and operate the proposed market by a public agency.

TABLE 16.—*Estimated annual costs of debt service for the proposed wholesale food distribution center at the Puerto Nuevo site if publicly financed and operated, San Juan, P.R., 1964*

Type of operator	Amount to be financed	Annual cost		
		Revenue bonds ¹	Contingency ²	Total
Fruits and vegetables	Dollars 789,712	Dollars 45,669	Dollars 9,134	Dollars 54,803
Meat and meat products	1,012,057	58,527	11,705	70,232
Groceries and other products	10,077,647	582,790	116,558	699,348
Total	11,879,416	686,986	137,397	824,383

¹ Based on costs of 4 percent, amortized for a 30-year period. Annual payments for principal and interest are \$57.83 per \$1,000.

² Based on 20 percent of the annual debt service for bonds.

TABLE 17.—*Estimated total annual revenue, including reserves and contingency, necessary for public financing and operation of the proposed wholesale food distribution center at the Puerto Nuevo site, San Juan, P.R., 1964*

Type of operator	Management	Insurance, maintenance, and repairs	Taxes	Debt service	Total revenue required
	Dollars	Dollars	Dollars	Dollars	Dollars
Fruits and vegetables.....	2,541	4,640	1,310	54,803	63,294
Meat and meat products.....	3,311	6,106	1,707	70,232	81,356
Groceries and other products.....	32,648	59,803	16,835	699,348	808,634
Total.....	38,500	70,549	19,852	824,383	953,284

ESTIMATED RENTAL CHARGES

To amortize the indebtedness of the proposed market, pay the necessary taxes and insurance, maintain and repair the facilities required, and provide the necessary management, certain charges must be assessed the tenants or owners of the market. Several methods and combinations of methods have been used in various cities. The most satisfactory, easiest to administer, and the least complicated is the charging of rentals based on a square footage for the facilities. The charges made should be sufficient to cover adequately all the costs detailed in the previous sections of this report, but should not be at a level that will cause a surplus to be accumulated, other than the necessary reserves and contingencies. Rental charges should yield \$1,522,636 annually if the market is financed and operated as a private interest or \$953,284 if it is publicly financed and operated.

Table 18 gives a summary of the square foot rentals for the various kinds of floor space required to yield the above revenues. Under public financing and operation, a fruit and vegetable operator renting a 25-foot by 100-foot unit would pay about \$6,000 rent annually. A meat or meat products operator renting a similar unit, but with an insulated first floor area and a complete second floor, would pay about \$8,500 rental annually, whereas a groceries and other products operator renting a 25-foot by 100-foot unit would pay about \$4,500 rent annually. Fruit and vegetable units and the grocery units, would include 375 square feet of mezzanine space which could also be used for light storage if there were no need for office space.

A private corporation financing and operating the proposed facilities would require an average rental of \$2.60 per square foot, a public agency would require \$1.63 per square foot. Rentals per unit would also reflect these higher costs.

Additional office space would be available on the second floor of the building housing the meat and meat products operators. Leases for this space

would be negotiated between the operator leasing or renting the first floor area and the prospective office renter. The tenant of the first floor would be responsible for all rental payments, occupancy, and other requirements. Prospective tenants of these office areas would include sales organizations serving the food trade, trade associations, market management, and other related activities that required only office space.

Rentals for the units devoted to banking and restaurants would be similar to those charged occupants of other multiple-occupancy units. They would, perhaps, be slightly higher, depending upon the amount of interior finish provided the occupants of these facilities.

Table 19 shows the estimated annual costs and savings for selected cost items in marketing food and food products through present and proposed facilities, using the most economical method of financing and operation. These handling and operating costs are based on the types and arrangements of facilities as previously discussed, and the assumption is made that the proper kinds and amounts of handling equipment will be used.

The estimated total annual net savings, compared to present market costs, are \$716,257. Savings in marketing fruits and vegetables were estimated at \$110,425, on meat and meat products at \$288,266, and on groceries and other products at \$311,566 annually.

Cost reductions were not considered on the total volume of product, but only on that portion which is being handled by operators who will need to be relocated because of urban renewal or who have facilities that were considered too small, or otherwise inadequate. It is proposed that 61 operators would relocate in the proposed facilities. This includes all operators handling meat and fruits and vegetables and 30 of the grocery wholesalers.

These operators currently are occupying a total of 662,127 square feet of floor space. In the proposed plan they would occupy a total of 588,675 square feet.

TABLE 18.—*Estimated annual rentals necessary per square foot of floor space to finance and operate the proposed market by private and public agencies, San Juan, P.R., 1964*

Type of operator and floor space	Space proposed	Type of financing and operation			
		Private		Public	
		Rate per sq. ft.	Yield	Rate per sq. ft.	Yield
Fruits and vegetables:					
Multiple-occupancy:					
First floor ¹	Sq. ft. 25,000 3,750	Dollars 3.75 2.00	Dollars 93,750 7,500	Dollars 2.25 1.60	Dollars 56,250 6,000
Mezzanine					
Total or average	28,750	3.52	101,250	2.17	62,250
Meat and meat products:					
Multiple-occupancy:					
First floor ¹	25,000 17,500	3.75 2.00	93,750 35,000	2.25 1.60	56,250 28,000
Second floor					
Total or average	42,500	3.03	128,750	1.98	84,250
Groceries and other products: ²					
Multiple-occupancy:					
First floor ¹	135,000 21,625	2.60 2.45	351,000 52,981	1.65 1.50	222,750 32,438
Mezzanine ³					
Limited-purpose:					
First floor	312,800 48,000	2.50 2.40	782,000 115,200	1.55 1.50	484,840 72,000
Mezzanine					
Total or average	517,425	2.51	1,301,181	1.57	812,028
All types:					
Total or average revenue	588,675	2.60	1,531,181	1.63	958,528
Total revenue required	588,675	2.59	1,522,636	1.62	953,284
Excess revenue			8,545		5,244

¹ Includes platform space.² Includes multiple-occupancy units of 4,250 square feet for restaurant and 2,875 square feet for bank.³ Includes second floor of multiple-occupancy unit for use of the restaurant and public restrooms.

Handling Costs

With the facilities proposed and the proper handling methods and equipment used, it is estimated that handling costs for food products may be reduced \$301,439 annually. The major savings that may be achieved result from increased efficiency in handling groceries and other products. These efficiencies are mainly the result of (1) platforms being level with truckbeds, (2) the new layout, which will improve product flow and space allocation, and (3) the single-floor operations that are proposed. Estimated savings in handling costs were \$257,572 annually for groceries and other products, \$33,503 for meat and meat products, and \$10,364 for fruits and vegetables.

Transfers

Savings on transfers between operators are an important advantage for a central market.

The transfer of product between operators is a necessary function and insures that the maximum benefit from the products being handled and distributed will be obtained. It also provides operators an excellent and efficient source for supplies either not carried, but requested or demanded by customers, or products which are not on hand. Savings in the transfer of product are possible because of connecting platforms, lack of traffic congestion where a vehicle must be used to effect the physical transfer, shorter distances, and more efficient handling methods. Savings in this area are necessarily small because of the limited amount of transfers.

Estimated savings of \$21,123 in transfer cost are possible in the proposed facilities, of which \$18,064 is in groceries and other products, \$2,095 is in meat and meat products, and the remaining \$964 is in the transfer of fruits and vegetables.

TABLE 19.—*Estimates of specified annual costs and savings for marketing food in present and proposed facilities, San Juan, P.R., 1964*

Type of operator and cost item	Volume handled ¹	Present		Proposed ²		Saving
		Cost per ton	Total cost	Cost per ton	Total cost	
Fruits and vegetables:						
Handling ³	Tons 29,612	Dollars 4.35	Dollars 128,812	Dollars 4.00	Dollars 118,448	Dollars 10,364
Transfer ⁴	1,269	3.76	4,771	3.00	3,807	964
Spoilage, theft, deterioration ⁵	29,612	7.00	207,284	3.50	103,642	103,642
Rentals ⁶	29,612	1.95	57,640	2.10	62,185	-4,545
Total	29,612	13.46	398,507	9.73	288,082	110,425
Meat and meat products:						
Handling	34,539	6.97	240,737	6.00	207,234	33,503
Transfer	1,465	4.43	6,490	3.00	4,395	2,095
Spoilage, theft, deterioration	34,539	7.50	259,043	3.75	129,521	129,522
Rentals ⁶	34,539	6.01	207,421	2.44	84,275	123,146
Total	34,539	20.66	713,691	12.32	425,425	288,266
Groceries and other products:						
Handling	599,005	2.43	1,455,582	2.00	1,198,010	257,572
Transfer	78,679	1.98	155,784	1.75	137,720	18,064
Spoilage, theft, deterioration ⁵	599,005	1.90	1,138,110	0.95	569,055	569,055
Rentals ⁶	599,005	0.48	287,522	1.36	814,647	-527,125
Total	599,005	5.07	3,036,998	4.54	2,719,432	317,566
Total all commodities	663,156	6.26	4,149,196	5.18	3,432,939	716,257

¹ Volumes included for meat and meat products and for fruits and vegetables in the proposed facilities are identical to the volumes handled presently because all operators dealing in these products will probably move, or their volume will be absorbed by other operators. It is estimated that 30 of the 52 groceries and other operators will relocate in the proposed facilities. Only the volume of these operators is included in calculating the savings from improved facilities.

² Estimated costs and savings presented are those using public financing and operation. Private financing would be considerably higher.

³ Does not include costs of transferring products between operators.

⁴ Volume handled only between operators in San Juan.

⁵ Savings are estimated at 50 percent of the estimated losses.

⁶ Based on actual rents paid or rental value of owner-occupied facilities.

Spoilage, Theft, and Deterioration

The costs of spoilage, theft, and product deterioration in the proposed facilities are estimated at half of what they are in the facilities currently occupied. A 50-percent reduction should be possible, as indicated by research in other cities with similar commodities. Thefts would be reduced because the facilities are designed for adequate supervision. With proper facilities and proper handling methods, only minimum product deterioration should occur; longer shelf life, fewer distress sales, and better stock control would all contribute to making this possible.

The total savings on costs of spoilage, theft, and deterioration are estimated at \$802,219 annually, of which \$569,055 is in groceries and other products, \$129,522 is in meat and meat products, and \$103,642 is in fruits and vegetables.

Rentals

Wide variations are noted in the estimated rentals required for public financing and operation of the proposed market. Estimated rentals for fruit and vegetable operators will be only \$4,545 higher in the proposed facilities than they currently are paying; meat and meat products operators will pay \$123,146 less than they are paying now; and groceries and other products operators will pay \$527,125 more than they are presently paying for rent. Estimated rentals in the proposed facilities are \$408,524 greater than the 61 operators are currently paying for their present quarters.

Even though some operators would pay considerably more rent than they are currently paying, the savings that are possible in handling costs, transfer cost, and reduced spoilage, theft, and product deterioration more than offset the in-

creased rentals required. This is true for all commodity groups.

In addition to the savings that were determined objectively, there are a number of benefits that cannot be measured effectively.

Nonmeasurable Savings

Improvements in the facilities for marketing and handling food will benefit the entire economy. The central market will provide a place where Puerto Rican products can be assembled, graded, packed, and prepared for export, and the proper kinds and types of facilities required to distribute a wide range and type of product throughout the entire Caribbean area. Furthermore, the facilities will provide an opportunity to improve the waterfront area in old San Juan and create an ideal tourist attraction for the island.

Many other savings possible in a modern food wholesale distribution facility cannot be measured accurately in dollars. Such savings would be shared by producers, market operators, buyers, market employees, transportation agencies, consumers, and the city.

Producers

Producers, whether located in the United States or Puerto Rico, processors, and a great number of others who assist in supplying food products to consumers would benefit in many ways from an efficient wholesale market. Improvements in the operation of the various price-reflecting and price-making forces would result. Elimination of many of the inefficient features of the present market would tend to pass some of the savings back to the producer in the form of higher prices. If the savings were transferred back to the consumer in the form of lower prices, consumers would tend to buy more. If marked improvements in the quality of food resulted, the overall demand for food would increase.

Market Operators

In addition to specific savings enumerated previously, individual operators would be able to operate their businesses fewer hours each day. Products could be loaded or unloaded at any time during the day, which would help regulate the hours of market operation. Market operators would also benefit from improvements in parking, working conditions, and the general environment.

Market Employees

Working conditions for employees in handling operations would be improved materially in a new market. Since buildings are designed for efficient handling, the worker's job would be less arduous,

his productivity should be increased, and over a period of time his hourly earnings might be expected to increase. Regular hours of work could be arranged, and overtime or irregular employment could be held to a minimum. With the building of a complete new market, the general environment for work would be improved considerably, and many of the conveniences not now available could be provided.

Buyers

In the proposed market, buyers would be able to arrive at the market, make their selections, load their trucks or make arrangements for transportation, and leave without undue delay or difficulty. Examination, comparison, and selection of products would be easier and faster for the buyer, because the proposed facilities are designed for ease of inspection, and once the selection was completed, the order could be assembled quickly and efficiently.

Transportation Agencies

Transportation agencies bringing food products to Puerto Rico and firms bringing or delivering food to or from the proposed market would benefit in shorter delivery times, quicker loading, and easier movement from one market operator to another.

Costs of transporting from dockside to operators' places of business would be lowered, and delivery distances would be shortened.

Local producers and truckers would benefit from the construction of the proposed market because it would reduce traffic congestion and increase parking space. The time required to deliver a load of produce to the market would be reduced substantially.

The Municipality

The construction of a new wholesale market for food products would benefit the city of San Juan in several ways: (1) The acute traffic problem in the old market areas would be partially alleviated, (2) the transfer of the market to modern, concentrated facilities would assist the city in enforcing sanitary, fire, and police regulations, (3) the relocation of the wholesalers would facilitate the rehabilitation of a valuable portion of San Juan for uses that would increase the tax base, (4) an area which is relatively undeveloped will be brought into use at the new location, thus improving an important area of the city, and (5) and increased volume of business and associated interests would result from efficient facilities.

Consumers

No group will benefit as much as will the consumers who depend upon the wholesale markets

of San Juan for their supplies of food. From improved facilities, they should be able to obtain a volume of quality products in the best possible condition. Many of the present unsanitary facili-

ties that result in inferior products would be eliminated. Some of the savings that are possible could be reflected in the prices consumers pay for their food.

